SEQUENCE LISTING

<110>   Lambeth, J. David
        Cheng, Guangjie
        McCoy, James

<120>   Methods and Transgenic Mouse Model for Identifying and Modulating
Factors Involved in the Production of Reactive Oxygen Intermediates

<130>   05501-0211 (43150-286808)

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<141>   2003-07-14

<150>   US 60/395,498
<151>   2002-07-12

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Phe Ser Val Leu Phe Leu Val Val Trp Leu Gly Leu Asn Val Phe Leu
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ttt gtg gat gcc ttc ctg aaa tat gag aag gcc gac aaa tac tac tac      329
Phe Val Asp Ala Phe Leu Lys Tyr Glu Lys Ala Asp Lys Tyr Tyr Tyr
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aca aga aaa atc ctt ggg tca aca ttg gcc tgt gcc cga gcg tct gct      377
Thr Arg Lys Ile Leu Gly Ser Thr Leu Ala Cys Ala Arg Ala Ser Ala
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ctc tgc ttg aat ttt aac agc acg ctg atc ctg ctt cct gtg tgt cgc      425
Leu Cys Leu Asn Phe Asn Ser Thr Leu Ile Leu Leu Pro Val Cys Arg
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aat ctg ctg tcc ttc ctg agg ggc acc tgc tca ttt tgc agc cgc aca      473
Asn Leu Leu Ser Phe Leu Arg Gly Thr Cys Ser Phe Cys Ser Arg Thr
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ctg aga aag caa ttg gat cac aac ctc acc ttc cac aag ctg gtg gcc      521
Leu Arg Lys Gln Leu Asp His Asn Leu Thr Phe His Lys Leu Val Ala
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tat atg atc tgc cta cat aca gct att cac atc att gca cac ctg ttt      569
Tyr Met Ile Cys Leu His Thr Ala Ile His Ile Ile Ala His Leu Phe
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aac ttt gac tgc tat agc aga agc cga cag gcc aca gat ggc·tcc ctt      617
Asn Phe Asp Cys Tyr Ser Arg Ser Arg Gln Ala Thr Asp Gly Ser Leu
            125             130             135

gcc tcc att ctc tcc agc cta tct cat gat gag aaa aag ggg ggt tct      665
Ala Ser Ile Leu Ser Ser Leu Ser His Asp Glu Lys Lys Gly Gly Ser
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tgg cta aat ccc atc cag tcc cga aac acg aca gtg gag tat gtg aca      713
Trp Leu Asn Pro Ile Gln Ser Arg Asn Thr Thr Val Glu Tyr Val Thr
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ttc acc agc gtt gct ggt ctc act gga gtg atc atg aca ata gcc ttg      761
Phe Thr Ser Val Ala Gly Leu Thr Gly Val Ile Met Thr Ile Ala Leu
170             175             180             185

att ctc atg gta act tca gct act gag ttc atc cgg agg agt tat ttt      809
Ile Leu Met Val Thr Ser Ala Thr Glu Phe Ile Arg Arg Ser Tyr Phe
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        220   225   230

agc atg aat gag agt cat cct cgc aag tgt gca gag tct ttt gag atg   953
Ser Met Asn Glu Ser His Pro Arg Lys Cys Ala Glu Ser Phe Glu Met
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tgg gat gat cgt gac tcc cac tgt agg cgc cct aag ttt gaa ggg cat   1001
Trp Asp Asp Arg Asp Ser His Cys Arg Arg Pro Lys Phe Glu Gly His
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ccc cct gag tct tgg aag tgg atc ctt gca ccg gtc att ctt tat atc   1049
Pro Pro Glu Ser Trp Lys Trp Ile Leu Ala Pro Val Ile Leu Tyr Ile
                    270   275   280

tgt gaa agg atc ctc cgg ttt tac cgc tcc cag cag aag gtt gtg att   1097
Cys Glu Arg Ile Leu Arg Phe Tyr Arg Ser Gln Gln Lys Val Val Ile
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acc aag gtt gtt atg cac cca tcc aaa gtt ttg gaa ttg cag atg aac   1145
Thr Lys Val Val Met His Pro Ser Lys Val Leu Glu Leu Gln Met Asn
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aag cgt ggc ttc agc atg gaa gtg ggg cag tat atc ttt gtt aat tgc   1193
Lys Arg Gly Phe Ser Met Glu Val Gly Gln Tyr Ile Phe Val Asn Cys
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ccc tca atc tct ctc ctg gaa tgg cat cct ttt act ttg acc tct gct   1241
Pro Ser Ile Ser Leu Leu Glu Trp His Pro Phe Thr Leu Thr Ser Ala
330   335   340   345

cca gag gaa gat ttc ttc tcc att cat atc cga gca gca ggg gac tgg   1289
Pro Glu Glu Asp Phe Phe Ser Ile His Ile Arg Ala Ala Gly Asp Trp
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aca gaa aat ctc ata agg gct ttc gaa caa caa tat tca cca att ccc   1337
Thr Glu Asn Leu Ile Arg Ala Phe Glu Gln Gln Tyr Ser Pro Ile Pro
            365   370   375

agg att gaa gtg gat ggt ccc ttt ggc aca gcc agt gag gat gtt ttc   1385
Arg Ile Glu Val Asp Gly Pro Phe Gly Thr Ala Ser Glu Asp Val Phe
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cag tat gaa gtg gct gtg ctg gtt gga gca gga att ggg gtc acc ccc   1433
Gln Tyr Glu Val Ala Val Leu Val Gly Ala Gly Ile Gly Val Thr Pro
        395   400   405

ttt gct tct atc ttg aaa tcc atc tgg tac aaa ttc cag tgt gca gac   1481
Phe Ala Ser Ile Leu Lys Ser Ile Trp Tyr Lys Phe Gln Cys Ala Asp
410   415   420   425

cac aac ctc aaa aca aaa aag atc tat ttc tac tgg atc tgc agg gag   1529
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His Asn Leu Lys Thr Lys Lys Ile Tyr Phe Tyr Trp Ile Cys Arg Glu
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Thr Gly Ala Phe Ser Trp Phe Asn Asn Leu Leu Thr Ser Leu Glu Gln
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gag atg gag gaa tta ggc aaa gtg ggt ttt cta aac tac cgt ctc ttc    1625
Glu Met Glu Glu Leu Gly Lys Val Gly Phe Leu Asn Tyr Arg Leu Phe
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ctc acc gga tgg gac agc aat att gtt ggt cat gca gca tta aac ttt    1673
Leu Thr Gly Trp Asp Ser Asn Ile Val Gly His Ala Ala Leu Asn Phe
            475             480             485
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gac aag gcc act gac atc gtg aca ggt ctg aaa cag aaa acc tcc ttt    1721
Asp Lys Ala Thr Asp Ile Val Thr Gly Leu Lys Gln Lys Thr Ser Phe
490             495             500             505
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ggg aga cca atg tgg gac aat gag ttt tct aca ata gct acc tcc cac    1769
Gly Arg Pro Met Trp Asp Asn Glu Phe Ser Thr Ile Ala Thr Ser His
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ccc aag tct gta gtg gga gtt ttc tta tgt ggc cct cgg act ttg gca    1817
Pro Lys Ser Val Val Gly Val Phe Leu Cys Gly Pro Arg Thr Leu Ala
            525             530             535
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aag agc ctg cgc aaa tgc tgt cac cga tat tcc agt ctg gat cct aga    1865
Lys Ser Leu Arg Lys Cys Cys His Arg Tyr Ser Ser Leu Asp Pro Arg
            540             545             550
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aag gtt caa ttc tac ttc aac aaa gaa aat ttt tga gttataggaa         1911
Lys Val Gln Phe Tyr Phe Asn Lys Glu Asn Phe
555             560
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taaggacggt aatctgcatt ttgtctcttt gtatcttcag taattgagtt ataggaataa    1971

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tctggacagc catgactgta gcaaggcttg atagcagaag tttggtggtt canaattata    2271

caactaatcc caggtgattt tatcaattcc agtgttacca tctcctgagt tttggtttgt    2331

aatcttttgt ccctcccacc cccacagaag attttaagta gggtgacttt ttaaataaaa    2391

atttattgaa taattaatga taaaacataa taataaacat aaataataaa caaaattacc    2451

gagaacccca tccccatata acaccaacag tgtacatgtt tactgtcact tttgatatgg    2511
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Tyr Glu Lys Ala Asp Lys Tyr Tyr Tyr Thr Arg Lys Ile Leu Gly Ser
            35   40   45

Thr Leu Ala Cys Ala Arg Ala Ser Ala Leu Cys Leu Asn Phe Asn Ser
        50   55   60

Thr Leu Ile Leu Leu Pro Val Cys Arg Asn Leu Leu Ser Phe Leu Arg
65   70   75   80

Gly Thr Cys Ser Phe Cys Ser Arg Thr Leu Arg Lys Gln Leu Asp His
            85   90   95

Asn Leu Thr Phe His Lys Leu Val Ala Tyr Met Ile Cys Leu His Thr
            100   105   110

Ala Ile His Ile Ile Ala His Leu Phe Asn Phe Asp Cys Tyr Ser Arg
            115   120   125

Ser Arg Gln Ala Thr Asp Gly Ser Leu Ala Ser Ile Leu Ser Ser Leu
        130   135   140

Ser His Asp Glu Lys Lys Gly Gly Ser Trp Leu Asn Pro Ile Gln Ser
145   150   155   160

Arg Asn Thr Thr Val Glu Tyr Val Thr Phe Thr Ser Val Ala Gly Leu
                165   170   175

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Thr Gly Val Ile Met Thr Ile Ala Leu Ile Leu Met Val Thr Ser Ala
            180             185             190

Thr Glu Phe Ile Arg Arg Ser Tyr Phe Glu Val Phe Trp Tyr Thr His
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His Leu Phe Ile Phe Tyr Ile Leu Gly Leu Gly Ile His Gly Ile Gly
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Gly Ile Val Arg Gly Gln Thr Glu Glu Ser Met Asn Glu Ser His Pro
225             230             235             240

Arg Lys Cys Ala Glu Ser Phe Glu Met Trp Asp Asp Arg Asp Ser His
            245             250             255

Cys Arg Arg Pro Lys Phe Glu Gly His Pro Pro Glu Ser Trp Lys Trp
            260             265             270

Ile Leu Ala Pro Val Ile Leu Tyr Ile Cys Glu Arg Ile Leu Arg Phe
            275             280             285

Tyr Arg Ser Gln Gln Lys Val Val Ile Thr Lys Val Val Met His Pro
    290             295             300

Ser Lys Val Leu Glu Leu Gln Met Asn Lys Arg Gly Phe Ser Met Glu
305             310             315             320

Val Gly Gln Tyr Ile Phe Val Asn Cys Pro Ser Ile Ser Leu Leu Glu
            325             330             335

Trp His Pro Phe Thr Leu Thr Ser Ala Pro Glu Glu Asp Phe Phe Ser
            340             345             350

Ile His Ile Arg Ala Ala Gly Asp Trp Thr Glu Asn Leu Ile Arg Ala
            355             360             365

Phe Glu Gln Gln Tyr Ser Pro Ile Pro Arg Ile Glu Val Asp Gly Pro
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Phe Gly Thr Ala Ser Glu Asp Val Phe Gln Tyr Glu Val Ala Val Leu
385             390             395             400
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Val Gly Ala Gly Ile Gly Val Thr Pro Phe Ala Ser Ile Leu Lys Ser
            405             410             415

Ile Trp Tyr Lys Phe Gln Cys Ala Asp His Asn Leu Lys Thr Lys Lys
            420             425             430

Ile Tyr Phe Tyr Trp Ile Cys Arg Glu Thr Gly Ala Phe Ser Trp Phe
            435             440             445

Asn Asn Leu Leu Thr Ser Leu Glu Gln Glu Met Glu Glu Leu Gly Lys
    450             455             460

Val Gly Phe Leu Asn Tyr Arg Leu Phe Leu Thr Gly Trp Asp Ser Asn
465             470             475             480

Ile Val Gly His Ala Ala Leu Asn Phe Asp Lys Ala Thr Asp Ile Val
            485             490             495

Thr Gly Leu Lys Gln Lys Thr Ser Phe Gly Arg Pro Met Trp Asp Asn
            500             505             510

Glu Phe Ser Thr Ile Ala Thr Ser His Pro Lys Ser Val Val Gly Val
            515             520             525

Phe Leu Cys Gly Pro Arg Thr Leu Ala Lys Ser Leu Arg Lys Cys Cys
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                                               Met Met Gly Cys
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tgg att ttg aat gag ggt ctc tcc acc ata tta gta ctc tca tgg ctg        163
Trp Ile Leu Asn Glu Gly Leu Ser Thr Ile Leu Val Leu Ser Trp Leu
5               10              15                  20

gga ata aat ttt tat ctg ttt att gac acg ttc tac tgg tat gaa gag        211
Gly Ile Asn Phe Tyr Leu Phe Ile Asp Thr Phe Tyr Trp Tyr Glu Glu
                25              30                  35

gag gag tct ttc cat tac aca cga gtt att ttg ggt tca aca ctg gct        259
Glu Glu Ser Phe His Tyr Thr Arg Val Ile Leu Gly Ser Thr Leu Ala
            40              45                  50

tgg gca cga gca tcc gca ctg tgc ctg aat ttt aac tgc atg cta att        307
Trp Ala Arg Ala Ser Ala Leu Cys Leu Asn Phe Asn Cys Met Leu Ile
        55              60                  65

cta ata cct gtc agt cga aac ctt att tca ttc ata aga gga aca agt        355
Leu Ile Pro Val Ser Arg Asn Leu Ile Ser Phe Ile Arg Gly Thr Ser
    70              75                  80

att tgc tgc aga gga ccg tgg agg agg caa tta gac aaa aac ctc aga        403
Ile Cys Cys Arg Gly Pro Trp Arg Arg Gln Leu Asp Lys Asn Leu Arg
85              90                  95                  100

ttt cac aaa ctg gtc gcc tat ggg ata gct gtt aat gca acc atc cac        451
Phe His Lys Leu Val Ala Tyr Gly Ile Ala Val Asn Ala Thr Ile His
                105             110                 115

atc gtg gcg cat ttc ttc aac ctg gaa cgc tac cac tgg agc cag tcc        499
Ile Val Ala His Phe Phe Asn Leu Glu Arg Tyr His Trp Ser Gln Ser
            120             125                 130

gag gag gcc cag gga ctt ctg gcc gca ctt tcc aag ctg ggc aac acc        547
Glu Glu Ala Gln Gly Leu Leu Ala Ala Leu Ser Lys Leu Gly Asn Thr
            135             140                 145

cct aac gag agc tac ctc aac cct gtc cgg acc ttc ccc aca aac aca        595
Pro Asn Glu Ser Tyr Leu Asn Pro Val Arg Thr Phe Pro Thr Asn Thr
            150             155                 160

acc act gaa ttg cta agg aca ata gca ggc gtc acc ggt ctg gtg atc        643
Thr Thr Glu Leu Leu Arg Thr Ile Ala Gly Val Thr Gly Leu Val Ile
165             170                 175                 180

tct ctg gct tta gtc ttg atc atg acc tcg tca act gag ttc atc aga        691
Ser Leu Ala Leu Val Leu Ile Met Thr Ser Ser Thr Glu Phe Ile Arg
            185             190                 195
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cag gcc tcc tat gag ttg ttc tgg tac aca cac cat gtt ttc atc gtc        739
Gln Ala Ser Tyr Glu Leu Phe Trp Tyr Thr His His Val Phe Ile Val
            200             205             210

ttc ttt ctc agc ctg gcc atc cat ggg acg ggt cgg att gtt cga ggc        787
Phe Phe Leu Ser Leu Ala Ile His Gly Thr Gly Arg Ile Val Arg Gly
            215             220             225

caa acc caa gac agt ctc tct ctg cac aac atc acc ttc tgt aga gac        835
Gln Thr Gln Asp Ser Leu Ser Leu His Asn Ile Thr Phe Cys Arg Asp
            230             235             240

cgc tat gca gaa tgg cag aca gtg gcc caa tgc ccc gtg cct caa ttt        883
Arg Tyr Ala Glu Trp Gln Thr Val Ala Gln Cys Pro Val Pro Gln Phe
245             250             255             260

tct ggc aag gaa ccc tcg gct tgg aaa tgg att tta ggc cct gtg gtc        931
Ser Gly Lys Glu Pro Ser Ala Trp Lys Trp Ile Leu Gly Pro Val Val
                265             270             275

ttg tat gca tgt gaa aga ata att agg ttc tgg cga ttt caa caa gaa        979
Leu Tyr Ala Cys Glu Arg Ile Ile Arg Phe Trp Arg Phe Gln Gln Glu
            280             285             290

gtt gtc att acc aag gtg gta agc cac ccc tct gga gtc ctg gaa ctt       1027
Val Val Ile Thr Lys Val Val Ser His Pro Ser Gly Val Leu Glu Leu
            295             300             305

cac atg aaa aag cgt ggc ttt aaa atg gcg cca ggg cag tac atc ttg       1075
His Met Lys Lys Arg Gly Phe Lys Met Ala Pro Gly Gln Tyr Ile Leu
            310             315             320

gtg cag tgc cca gcc ata tct tcg ctg gag tgg cac ccc ttc acc ctt       1123
Val Gln Cys Pro Ala Ile Ser Ser Leu Glu Trp His Pro Phe Thr Leu
325             330             335             340

acc tct gcc ccc cag gaa gac ttt ttc agc gtg cac atc cgg gca gca       1171
Thr Ser Ala Pro Gln Glu Asp Phe Phe Ser Val His Ile Arg Ala Ala
                345             350             355

gga gac tgg aca gca gcg cta ctg gag gcc ttt ggg gca gag gga cag       1219
Gly Asp Trp Thr Ala Ala Leu Leu Glu Ala Phe Gly Ala Glu Gly Gln
            360             365             370

gcc ctc cag gag ccc tgg agc ctg cca agg ctg gca gtg gac ggg ccc       1267
Ala Leu Gln Glu Pro Trp Ser Leu Pro Arg Leu Ala Val Asp Gly Pro
            375             380             385

ttt gga act gcc ctg aca gat gta ttt cac tac cca gtg tgt gtg tgc       1315
Phe Gly Thr Ala Leu Thr Asp Val Phe His Tyr Pro Val Cys Val Cys
            390             395             400

gtt gcc gcg ggg atc gga gtc act ccc ttc gct gct ctt ctg aaa tct       1363
Val Ala Ala Gly Ile Gly Val Thr Pro Phe Ala Ala Leu Leu Lys Ser
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    Ile Trp Tyr Lys Cys Ser Glu Ala Gln Thr Pro Leu Lys Leu Ser Lys
                    425                     430                 435

    gtg tat ttc tac tgg att tgc cgg gat gca aga gct ttt gag tgg ttt       1459
    Val Tyr Phe Tyr Trp Ile Cys Arg Asp Ala Arg Ala Phe Glu Trp Phe
                440                     445                 450

    gct gat ctc tta ctc tcc ctg gaa aca cgg atg agt gag cag ggg aaa       1507
    Ala Asp Leu Leu Leu Ser Leu Glu Thr Arg Met Ser Glu Gln Gly Lys
                455                     460                 465

    act cac ttt ctg agt tat cat ata ttt ctt acc ggc tgg gat gaa aat       1555
    Thr His Phe Leu Ser Tyr His Ile Phe Leu Thr Gly Trp Asp Glu Asn
        470                     475                 480

    cag gct ctt cac ata gct tta cac tgg gac gaa aat act gac gtg att       1603
    Gln Ala Leu His Ile Ala Leu His Trp Asp Glu Asn Thr Asp Val Ile
    485                     490                 495                 500

    aca ggc tta aag cag aag acc ttc tat ggg agg ccc aac tgg aac aat       1651
    Thr Gly Leu Lys Gln Lys Thr Phe Tyr Gly Arg Pro Asn Trp Asn Asn
                    505                     510                 515

    gag ttc aag cag att gcc tac aat cac ccc agc agc agt att ggc gtg       1699
    Glu Phe Lys Gln Ile Ala Tyr Asn His Pro Ser Ser Ser Ile Gly Val
                    520                     525                 530

    ttc ttc tgt gga cct aaa gct ctc tcg agg aca ctt caa aag atg tgc       1747
    Phe Phe Cys Gly Pro Lys Ala Leu Ser Arg Thr Leu Gln Lys Met Cys
                535                     540                 545

    cac ttg tat tca tca gct gac ccc aga ggt gtt cat ttc tat tac aac       1795
    His Leu Tyr Ser Ser Ala Asp Pro Arg Gly Val His Phe Tyr Tyr Asn
        550                     555                 560

    aag gag agc ttc tag actttggagg tcaagtccag gcattgtgtt ttcaatcaag       1850
    Lys Glu Ser Phe
    565

    ttattgattc caaagaactc caccaggaat tcctgtgacg gcctgttgat atgagctccc       1910

    agttgggaac tggtgaataa taattaacta ttgtgaacag tacactatac catacttcct       1970

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            20   25   30

Trp Tyr Glu Glu Glu Glu Ser Phe His Tyr Thr Arg Val Ile Leu Gly
        35   40   45

Ser Thr Leu Ala Trp Ala Arg Ala Ser Ala Leu Cys Leu Asn Phe Asn
    50   55   60

Cys Met Leu Ile Leu Ile Pro Val Ser Arg Asn Leu Ile Ser Phe Ile
65   70   75   80

Arg Gly Thr Ser Ile Cys Cys Arg Gly Pro Trp Arg Arg Gln Leu Asp
            85   90   95

Lys Asn Leu Arg Phe His Lys Leu Val Ala Tyr Gly Ile Ala Val Asn
            100   105   110

Ala Thr Ile His Ile Val Ala His Phe Phe Asn Leu Glu Arg Tyr His
        115   120   125

Trp Ser Gln Ser Glu Glu Ala Gln Gly Leu Leu Ala Ala Leu Ser Lys
    130   135   140

Leu Gly Asn Thr Pro Asn Glu Ser Tyr Leu Asn Pro Val Arg Thr Phe
145   150   155   160

Pro Thr Asn Thr Thr Thr Glu Leu Leu Arg Thr Ile Ala Gly Val Thr
            165   170   175

Gly Leu Val Ile Ser Leu Ala Leu Val Leu Ile Met Thr Ser Ser Thr
        180   185   190

Glu Phe Ile Arg Gln Ala Ser Tyr Glu Leu Phe Trp Tyr Thr His His
    195   200   205

Val Phe Ile Val Phe Phe Leu Ser Leu Ala Ile His Gly Thr Gly Arg
    210   215   220

Ile Val Arg Gly Gln Thr Gln Asp Ser Leu Ser Leu His Asn Ile Thr
225   230   235   240

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                245   250   255

Val Pro Gln Phe Ser Gly Lys Glu Pro Ser Ala Trp Lys Trp Ile Leu
            260   265   270

Gly Pro Val Val Leu Tyr Ala Cys Glu Arg Ile Ile Arg Phe Trp Arg
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Val Leu Glu Leu His Met Lys Lys Arg Gly Phe Lys Met Ala Pro Gly
305   310   315   320

Gln Tyr Ile Leu Val Gln Cys Pro Ala Ile Ser Ser Leu Glu Trp His
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Pro Phe Thr Leu Thr Ser Ala Pro Gln Glu Asp Phe Phe Ser Val His
            340   345   350

Ile Arg Ala Ala Gly Asp Trp Thr Ala Ala Leu Leu Glu Ala Phe Gly
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Ala Glu Gly Gln Ala Leu Gln Glu Pro Trp Ser Leu Pro Arg Leu Ala
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Val Asp Gly Pro Phe Gly Thr Ala Leu Thr Asp Val Phe His Tyr Pro
385   390   395   400

Val Cys Val Cys Val Ala Ala Gly Ile Gly Val Thr Pro Phe Ala Ala
            405   410   415

Leu Leu Lys Ser Ile Trp Tyr Lys Cys Ser Glu Ala Gln Thr Pro Leu
        420   425   430

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Phe Glu Trp Phe Ala Asp Leu Leu Leu Ser Leu Glu Thr Arg Met Ser
    450             455             460


Glu Gln Gly Lys Thr His Phe Leu Ser Tyr His Ile Phe Leu Thr Gly
465             470             475             480


Trp Asp Glu Asn Gln Ala Leu His Ile Ala Leu His Trp Asp Glu Asn
            485             490             495


Thr Asp Val Ile Thr Gly Leu Lys Gln Lys Thr Phe Tyr Gly Arg Pro
        500             505             510


Asn Trp Asn Asn Glu Phe Lys Gln Ile Ala Tyr Asn His Pro Ser Ser
        515             520             525


Ser Ile Gly Val Phe Phe Cys Gly Pro Lys Ala Leu Ser Arg Thr Leu
    530             535             540


Gln Lys Met Cys His Leu Tyr Ser Ser Ala Asp Pro Arg Gly Val His
545             550             555             560


Phe Tyr Tyr Asn Lys Glu Ser Phe
            565


<210>  5
<211>  2044
<212>  DNA
<213>  Homo sapiens


<220>
<221>  CDS
<222>  (104)..(1810)


<400>  5
caaagacaaa ataatttact agggaagccc ttactaacga cccaacatcc agacacaggt     60

gagggagaag aaatttcctg acagccgaag agcaacaagt atc atg atg ggg tgc     115
                                              Met Met Gly Cys
                                                1

tgg att ttg aat gag ggt ctc tcc acc ata tta gta ctc tca tgg ctg     163
```

14

```
Trp Ile Leu Asn Glu Gly Leu Ser Thr Ile Leu Val Leu Ser Trp Leu
5                   10                  15                  20

gga ata aat ttt tat ctg ttt att gac acg ttc tac tgg tat gaa gag      211
Gly Ile Asn Phe Tyr Leu Phe Ile Asp Thr Phe Tyr Trp Tyr Glu Glu
                25                  30                  35

gag gag tct ttc cat tac aca cga gtt att ttg ggt tca aca ctg gct      259
Glu Glu Ser Phe His Tyr Thr Arg Val Ile Leu Gly Ser Thr Leu Ala
                40                  45                  50

tgg gca cga gca tcc gca ctg tgc ctg aat ttt aac tgc atg cta att      307
Trp Ala Arg Ala Ser Ala Leu Cys Leu Asn Phe Asn Cys Met Leu Ile
                55                  60                  65

cta ata cct gtc agt cga aac ctt att tca ttc ata aga gga aca agt      355
Leu Ile Pro Val Ser Arg Asn Leu Ile Ser Phe Ile Arg Gly Thr Ser
        70                  75                  80

att tgc tgc aga gga ccg tgg agg agg caa tta gac aaa aac ctc aga      403
Ile Cys Cys Arg Gly Pro Trp Arg Arg Gln Leu Asp Lys Asn Leu Arg
85                  90                  95                  100

ttt cac aaa ctg gtc gcc tat ggg ata gct gtt aat gca acc atc cac      451
Phe His Lys Leu Val Ala Tyr Gly Ile Ala Val Asn Ala Thr Ile His
                105                 110                 115

atc gtg gcg cat ttc ttc aac ctg gaa cgc tac cac tgg agc cag tcc      499
Ile Val Ala His Phe Phe Asn Leu Glu Arg Tyr His Trp Ser Gln Ser
                120                 125                 130

gag gag gcc cag gga ctt ctg gcc gca ctt tcc aag ctg ggc aac acc      547
Glu Glu Ala Gln Gly Leu Leu Ala Ala Leu Ser Lys Leu Gly Asn Thr
                135                 140                 145

cct aac gag agc tac ctc aac cct gtc cgg acc ttc ccc aca aac aca      595
Pro Asn Glu Ser Tyr Leu Asn Pro Val Arg Thr Phe Pro Thr Asn Thr
        150                 155                 160

acc act gaa ttg cta agg aca ata gca ggc gtc acc ggt ctg gtg atc      643
Thr Thr Glu Leu Leu Arg Thr Ile Ala Gly Val Thr Gly Leu Val Ile
165                 170                 175                 180

tct ctg gct tta gtc ttg atc atg acc tcg tca act gag ttc atc aga      691
Ser Leu Ala Leu Val Leu Ile Met Thr Ser Ser Thr Glu Phe Ile Arg
                185                 190                 195

cag gcc tcc tat gag ttg ttc tgg tac aca cac cat gtt ttc atc gtc      739
Gln Ala Ser Tyr Glu Leu Phe Trp Tyr Thr His His Val Phe Ile Val
                200                 205                 210

ttc ttt ctc agc ctg gcc atc cat ggg acg ggt cgg att gtt cga ggc      787
Phe Phe Leu Ser Leu Ala Ile His Gly Thr Gly Arg Ile Val Arg Gly
        215                 220                 225
```

```
caa acc caa gac agt ctc tct ctg cac aac atc acc ttc tgt aga gac        835
Gln Thr Gln Asp Ser Leu Ser Leu His Asn Ile Thr Phe Cys Arg Asp
    230             235             240

cgc tat gca gaa tgg cag aca gtg gcc caa tgc ccc gtg cct caa ttt        883
Arg Tyr Ala Glu Trp Gln Thr Val Ala Gln Cys Pro Val Pro Gln Phe
245             250             255             260

tct ggc aag gaa ccc tcg gct tgg aaa tgg att tta ggc cct gtg gtc        931
Ser Gly Lys Glu Pro Ser Ala Trp Lys Trp Ile Leu Gly Pro Val Val
            265             270             275

ttg tat gca tgt gaa aga ata att agg ttc tgg cga ttt caa caa gaa        979
Leu Tyr Ala Cys Glu Arg Ile Ile Arg Phe Trp Arg Phe Gln Gln Glu
            280             285             290

gtt gtc att acc aag gtg gta agc cac ccc tct gga gtc ctg gaa ctt       1027
Val Val Ile Thr Lys Val Val Ser His Pro Ser Gly Val Leu Glu Leu
        295             300             305

cac atg aaa aag cgt ggc ttt aaa atg gcg cca ggg cag tac atc ttg       1075
His Met Lys Lys Arg Gly Phe Lys Met Ala Pro Gly Gln Tyr Ile Leu
    310             315             320

gtg cag tgc cca gcc ata tct tcg ctg gag tgg cac ccc ttc acc ctt       1123
Val Gln Cys Pro Ala Ile Ser Ser Leu Glu Trp His Pro Phe Thr Leu
325             330             335             340

acc tct gcc ccc cag gaa gac ttt ttc agc gtg cac atc cgg gca gca       1171
Thr Ser Ala Pro Gln Glu Asp Phe Phe Ser Val His Ile Arg Ala Ala
            345             350             355

gga gac tgg aca gca gcg cta ctg gag gcc ttt ggg gca gag gga cag       1219
Gly Asp Trp Thr Ala Ala Leu Leu Glu Ala Phe Gly Ala Glu Gly Gln
            360             365             370

gcc ctc cag gag ccc tgg agc ctg cca agg ctg gca gtg gac ggg ccc       1267
Ala Leu Gln Glu Pro Trp Ser Leu Pro Arg Leu Ala Val Asp Gly Pro
        375             380             385

ttt gga act gcc ctg aca gat gta ttt cac tac cca gtg tgt gtg tgc       1315
Phe Gly Thr Ala Leu Thr Asp Val Phe His Tyr Pro Val Cys Val Cys
        390             395             400

gtt gcc gcg ggg atc gga gtc act ccc ttc gct gct ctt ctg aaa tct       1363
Val Ala Ala Gly Ile Gly Val Thr Pro Phe Ala Ala Leu Leu Lys Ser
405             410             415             420

ata tgg tac aaa tgc agt gag gca cag acc cca ctg aag ctg agc aag       1411
Ile Trp Tyr Lys Cys Ser Glu Ala Gln Thr Pro Leu Lys Leu Ser Lys
            425             430             435

gtg tat ttc tac tgg att tgc cgg gat gca aga gct ttt gag tgg ttt       1459
Val Tyr Phe Tyr Trp Ile Cys Arg Asp Ala Arg Ala Phe Glu Trp Phe
        440             445             450
```

```
gct gat ctc tta ctc tcc ctg gaa aca cgg atg agt gag cag ggg aaa     1507
Ala Asp Leu Leu Leu Ser Leu Glu Thr Arg Met Ser Glu Gln Gly Lys
        455             460             465

act cac ttt ctg agt tat cat ata ttt ctt acc ggc tgg gat gaa aat     1555
Thr His Phe Leu Ser Tyr His Ile Phe Leu Thr Gly Trp Asp Glu Asn
        470             475             480

cag gct ctt cac ata gct tta cac tgg gac gaa aat act gac gtg att     1603
Gln Ala Leu His Ile Ala Leu His Trp Asp Glu Asn Thr Asp Val Ile
485             490             495             500

aca ggc tta aag cag aag acc ttc tat ggg agg ccc aac tgg aac aat     1651
Thr Gly Leu Lys Gln Lys Thr Phe Tyr Gly Arg Pro Asn Trp Asn Asn
            505             510             515

gag ttc aag cag att gcc tac aat cac ccc agc agc agt att ggc gtg     1699
Glu Phe Lys Gln Ile Ala Tyr Asn His Pro Ser Ser Ser Ile Gly Val
            520             525             530

ttc ttc tgt gga cct aaa gct ctc tcg agg aca ctt caa aag atg tgc     1747
Phe Phe Cys Gly Pro Lys Ala Leu Ser Arg Thr Leu Gln Lys Met Cys
        535             540             545

cac ttg tat tca tca gct gac ccc aga ggt gtt cat ttc tat tac aac     1795
His Leu Tyr Ser Ser Ala Asp Pro Arg Gly Val His Phe Tyr Tyr Asn
        550             555             560

aag gag agc ttc tag actttggagg tcaagtccag gcattgtgtt ttcaatcaag     1850
Lys Glu Ser Phe
565

ttattgattc caaagaactc caccaggaat tcctgtgacg gcctgttgat atgagctccc     1910

agttgggaac tggtgaataa taattaacta ttgtgaacag tacactatac catacttcct     1970

tagcttataa ataacatgtc atatacaaca gaacaaaaac atttactgaa attaaaatat     2030

attatgtttc tcca                                                      2044


<210>  6
<211>  568
<212>  PRT
<213>  Homo sapiens

<400>  6

Met Met Gly Cys Trp Ile Leu Asn Glu Gly Leu Ser Thr Ile Leu Val
1               5               10              15


Leu Ser Trp Leu Gly Ile Asn Phe Tyr Leu Phe Ile Asp Thr Phe Tyr
            20              25              30
```

```
Trp Tyr Glu Glu Glu Glu Ser Phe His Tyr Thr Arg Val Ile Leu Gly
        35              40          45

Ser Thr Leu Ala Trp Ala Arg Ala Ser Ala Leu Cys Leu Asn Phe Asn
    50          55              60

Cys Met Leu Ile Leu Ile Pro Val Ser Arg Asn Leu Ile Ser Phe Ile
65              70          75              80

Arg Gly Thr Ser Ile Cys Cys Arg Gly Pro Trp Arg Arg Gln Leu Asp
            85          90              95

Lys Asn Leu Arg Phe His Lys Leu Val Ala Tyr Gly Ile Ala Val Asn
            100         105             110

Ala Thr Ile His Ile Val Ala His Phe Phe Asn Leu Glu Arg Tyr His
        115             120             125

Trp Ser Gln Ser Glu Glu Ala Gln Gly Leu Leu Ala Ala Leu Ser Lys
    130             135             140

Leu Gly Asn Thr Pro Asn Glu Ser Tyr Leu Asn Pro Val Arg Thr Phe
145             150             155             160

Pro Thr Asn Thr Thr Thr Glu Leu Leu Arg Thr Ile Ala Gly Val Thr
            165             170             175

Gly Leu Val Ile Ser Leu Ala Leu Val Leu Ile Met Thr Ser Ser Thr
            180             185             190

Glu Phe Ile Arg Gln Ala Ser Tyr Glu Leu Phe Trp Tyr Thr His His
        195             200             205

Val Phe Ile Val Phe Phe Leu Ser Leu Ala Ile His Gly Thr Gly Arg
    210             215             220

Ile Val Arg Gly Gln Thr Gln Asp Ser Leu Ser Leu His Asn Ile Thr
225             230             235             240

Phe Cys Arg Asp Arg Tyr Ala Glu Trp Gln Thr Val Ala Gln Cys Pro
```

```
            245                    250                    255

Val Pro Gln Phe Ser Gly Lys Glu Pro Ser Ala Trp Lys Trp Ile Leu
        260                 265                 270

Gly Pro Val Val Leu Tyr Ala Cys Glu Arg Ile Ile Arg Phe Trp Arg
        275                 280                 285

Phe Gln Gln Glu Val Val Ile Thr Lys Val Val Ser His Pro Ser Gly
    290                 295                 300

Val Leu Glu Leu His Met Lys Lys Arg Gly Phe Lys Met Ala Pro Gly
305                 310                 315                 320

Gln Tyr Ile Leu Val Gln Cys Pro Ala Ile Ser Ser Leu Glu Trp His
                325                 330                 335

Pro Phe Thr Leu Thr Ser Ala Pro Gln Glu Asp Phe Phe Ser Val His
            340                 345                 350

Ile Arg Ala Ala Gly Asp Trp Thr Ala Ala Leu Leu Glu Ala Phe Gly
        355                 360                 365

Ala Glu Gly Gln Ala Leu Gln Glu Pro Trp Ser Leu Pro Arg Leu Ala
    370                 375                 380

Val Asp Gly Pro Phe Gly Thr Ala Leu Thr Asp Val Phe His Tyr Pro
385                 390                 395                 400

Val Cys Val Cys Val Ala Ala Gly Ile Gly Val Thr Pro Phe Ala Ala
            405                 410                 415

Leu Leu Lys Ser Ile Trp Tyr Lys Cys Ser Glu Ala Gln Thr Pro Leu
        420                 425                 430

Lys Leu Ser Lys Val Tyr Phe Tyr Trp Ile Cys Arg Asp Ala Arg Ala
        435                 440                 445

Phe Glu Trp Phe Ala Asp Leu Leu Leu Ser Leu Glu Thr Arg Met Ser
    450                 455                 460
```

```
Glu Gln Gly Lys Thr His Phe Leu Ser Tyr His Ile Phe Leu Thr Gly
465             470             475             480


Trp Asp Glu Asn Gln Ala Leu His Ile Ala Leu His Trp Asp Glu Asn
                485             490             495


Thr Asp Val Ile Thr Gly Leu Lys Gln Lys Thr Phe Tyr Gly Arg Pro
            500             505             510


Asn Trp Asn Asn Glu Phe Lys Gln Ile Ala Tyr Asn His Pro Ser Ser
        515             520             525


Ser Ile Gly Val Phe Phe Cys Gly Pro Lys Ala Leu Ser Arg Thr Leu
    530             535             540


Gln Lys Met Cys His Leu Tyr Ser Ser Ala Asp Pro Arg Gly Val His
545             550             555             560


Phe Tyr Tyr Asn Lys Glu Ser Phe
            565
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<210> 7
<211> 2232
<212> DNA
<213> Homo sapiens

<220>
<221> CDS
<222> (87)..(1823)

<400> 7
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ccgcacaact gtaaccgctg ccccggccgc cgcccgctcc ttctcgggcc ggcgggcaca      60

gagcgcagcg cggcggggcc ggcggc atg gct gtg tcc tgg agg agc tgg ctc     113
                              Met Ala Val Ser Trp Arg Ser Trp Leu
                              1                   5

gcc aac gaa ggg gtt aaa cac ctc tgc ctg ttc atc tgg ctc tcc atg     161
Ala Asn Glu Gly Val Lys His Leu Cys Leu Phe Ile Trp Leu Ser Met
10                  15                  20                  25

aat gtc ctg ctt ttc tgg aaa acc ttc ttg ctg tat aac caa ggg cca     209
Asn Val Leu Leu Phe Trp Lys Thr Phe Leu Leu Tyr Asn Gln Gly Pro
                30                  35                  40

gag tat cac tac ctc cac cag atg ttg ggg cta gga ttg tgt cta agc     257
Glu Tyr His Tyr Leu His Gln Met Leu Gly Leu Gly Leu Cys Leu Ser
```

```
                    45                       50                       55
aga gcc tca gca tct gtt ctt aac ctc aac tgc agc ctt atc ctt tta       305
Arg Ala Ser Ala Ser Val Leu Asn Leu Asn Cys Ser Leu Ile Leu Leu
        60                   65                   70

ccc atg tgc cga aca ctc ttg gct tac ctc cga gga tca cag aag gtt       353
Pro Met Cys Arg Thr Leu Leu Ala Tyr Leu Arg Gly Ser Gln Lys Val
    75                   80                   85

cca agc agg aga acc agg aga ttg ttg gat aaa agc aga aca ttc cat       401
Pro Ser Arg Arg Thr Arg Arg Leu Leu Asp Lys Ser Arg Thr Phe His
90                   95                   100                  105

att acc tgt ggt gtt act atc tgt att ttc tca ggc gtg cat gtg gct       449
Ile Thr Cys Gly Val Thr Ile Cys Ile Phe Ser Gly Val His Val Ala
                110                  115                  120

gcc cat ctg gtg aat gcc ctc aac ttc tca gtg aat tac agt gaa gac       497
Ala His Leu Val Asn Ala Leu Asn Phe Ser Val Asn Tyr Ser Glu Asp
                125                  130                  135

ttt gtt gaa ctg aat gca gca aga tac cga gat gag gat cct aga aaa       545
Phe Val Glu Leu Asn Ala Ala Arg Tyr Arg Asp Glu Asp Pro Arg Lys
        140                  145                  150

ctt ctc ttc aca act gtt cct ggc ctg aca ggg gtc tgc atg gtg gtg       593
Leu Leu Phe Thr Thr Val Pro Gly Leu Thr Gly Val Cys Met Val Val
        155                  160                  165

gtg cta ttc ctc atg atc aca gcc tct aca tat gca ata aga gtt tct       641
Val Leu Phe Leu Met Ile Thr Ala Ser Thr Tyr Ala Ile Arg Val Ser
170                  175                  180                  185

aac tat gat atc ttc tgg tat act cat aac ctc ttc ttt gtc ttc tac       689
Asn Tyr Asp Ile Phe Trp Tyr Thr His Asn Leu Phe Phe Val Phe Tyr
                190                  195                  200

atg ctg ctg acg ttg cat gtt tca gga ggg ctg ctg aag tat caa act       737
Met Leu Leu Thr Leu His Val Ser Gly Gly Leu Leu Lys Tyr Gln Thr
        205                  210                  215

aat tta gat acc cac cct ccc ggc tgc atc agt ctt aac cga acc agc       785
Asn Leu Asp Thr His Pro Pro Gly Cys Ile Ser Leu Asn Arg Thr Ser
        220                  225                  230

tct cag aat att tcc tta cca gag tat ttc tca gaa cat ttt cat gaa       833
Ser Gln Asn Ile Ser Leu Pro Glu Tyr Phe Ser Glu His Phe His Glu
        235                  240                  245

cct ttc cct gaa gga ttt tca aaa ccg gca gag ttt acc cag cac aaa       881
Pro Phe Pro Glu Gly Phe Ser Lys Pro Ala Glu Phe Thr Gln His Lys
250                  255                  260                  265

ttt gtg aag att tgt atg gaa gag ccc aga ttc caa gct aat ttt cca       929
```

```
Phe Val Lys Ile Cys Met Glu Glu Pro Arg Phe Gln Ala Asn Phe Pro
            270             275             280
```

```
cag act tgg ctt tgg att tct gga cct ttg tgc ctg tac tgt gcc gaa    977
Gln Thr Trp Leu Trp Ile Ser Gly Pro Leu Cys Leu Tyr Cys Ala Glu
            285             290             295
```

```
aga ctt tac agg tat atc cgg agc aat aag cca gtc acc atc att tcg    1025
Arg Leu Tyr Arg Tyr Ile Arg Ser Asn Lys Pro Val Thr Ile Ile Ser
            300             305             310
```

```
gtc ata agt cat ccc tca gat gtc atg gaa atc cga atg gtc aaa gaa    1073
Val Ile Ser His Pro Ser Asp Val Met Glu Ile Arg Met Val Lys Glu
            315             320             325
```

```
aat ttt aaa gca aga cct ggt cag tat att act cta cat tgt ccc agt    1121
Asn Phe Lys Ala Arg Pro Gly Gln Tyr Ile Thr Leu His Cys Pro Ser
330             335             340             345
```

```
gta tct gca tta gaa aat cat cca ttt acc ctc aca atg tgt cca act    1169
Val Ser Ala Leu Glu Asn His Pro Phe Thr Leu Thr Met Cys Pro Thr
            350             355             360
```

```
gaa acc aaa gca aca ttt ggg gtt cat ctt aaa ata gta gga gac tgg    1217
Glu Thr Lys Ala Thr Phe Gly Val His Leu Lys Ile Val Gly Asp Trp
            365             370             375
```

```
aca gaa cga ttt cga gat tta cta ctg cct cca tct agt caa gac tcc    1265
Thr Glu Arg Phe Arg Asp Leu Leu Leu Pro Pro Ser Ser Gln Asp Ser
            380             385             390
```

```
gaa att ctg ccc ttc att caa tct aga aat tat ccc aag ctg tat att    1313
Glu Ile Leu Pro Phe Ile Gln Ser Arg Asn Tyr Pro Lys Leu Tyr Ile
            395             400             405
```

```
gat ggt cct ttt gga agt cca ttt gag gaa tca ctg aac tat gag gtc    1361
Asp Gly Pro Phe Gly Ser Pro Phe Glu Glu Ser Leu Asn Tyr Glu Val
410             415             420             425
```

```
agc ctc tgc gtg gct gga ggc att gga gta act cca ttt gca tca ata    1409
Ser Leu Cys Val Ala Gly Gly Ile Gly Val Thr Pro Phe Ala Ser Ile
            430             435             440
```

```
ctc aac acc ctg ttg gat gac tgg aaa cca tac aag ctt aga aga cta    1457
Leu Asn Thr Leu Leu Asp Asp Trp Lys Pro Tyr Lys Leu Arg Arg Leu
            445             450             455
```

```
tac ttt att tgg gta tgc aga gat atc cag tcc ttc cgt tgg ttt gca    1505
Tyr Phe Ile Trp Val Cys Arg Asp Ile Gln Ser Phe Arg Trp Phe Ala
            460             465             470
```

```
gat tta ctc tgt atg ttg cat aac aag ttt tgg caa gag aac aga cct    1553
Asp Leu Leu Cys Met Leu His Asn Lys Phe Trp Gln Glu Asn Arg Pro
475             480             485
```

```
gac tat gtc aac atc cag ctg tac ctc agt caa aca gat ggg ata cag    1601
Asp Tyr Val Asn Ile Gln Leu Tyr Leu Ser Gln Thr Asp Gly Ile Gln
490             495             500             505

aag ata att gga gaa aaa tat cat gca ctg aat tca aga ctg ttt ata    1649
Lys Ile Ile Gly Glu Lys Tyr His Ala Leu Asn Ser Arg Leu Phe Ile
                510             515             520

gga cgt cct cgg tgg aaa ctt ttg ttt gat gaa ata gca aaa tat aac    1697
Gly Arg Pro Arg Trp Lys Leu Leu Phe Asp Glu Ile Ala Lys Tyr Asn
            525             530             535

aga gga aaa aca gtt ggt gtt ttc tgt tgt gga ccc aat tca cta tcc    1745
Arg Gly Lys Thr Val Gly Val Phe Cys Cys Gly Pro Asn Ser Leu Ser
            540             545             550

aag act ctt cat aaa ctg agt aac cag aac aac tca tat ggg aca aga    1793
Lys Thr Leu His Lys Leu Ser Asn Gln Asn Asn Ser Tyr Gly Thr Arg
            555             560             565

ttt gaa tac aat aaa gag tct ttc agc tga aaacttttgc catgaagcag      1843
Phe Glu Tyr Asn Lys Glu Ser Phe Ser
570             575

gactctaaag aaggaatgag tgcaatttct aagactttga aactcagcgg aatcaatcag   1903

ctgtgttatg ccaaagaata gtaaggtttt cttatttatg attatttgaa aatggaaatg   1963

tgagaatgtg gcaacatgac cgtcacatta catgtttaat ctggaaacca aagagaccct   2023

gaagaatatt tgatgtgatg attcattttc agttctcaaa ttaaaagaaa actgttagat   2083

gcacactgtt gattttcatg gtggattcaa gaactcccta gtgaggagct gaacttgctc   2143

aatctaaggc tgattgtcgt gttcctcttt aaattgtttt tggttgaaca aatgcaagat   2203

tgaacaaaat taaaaattca ttgaagctg                                     2232
```

<210> 8
<211> 578
<212> PRT
<213> Homo sapiens

<400> 8

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Met Ala Val Ser Trp Arg Ser Trp Leu Ala Asn Glu Gly Val Lys His
1               5               10              15


Leu Cys Leu Phe Ile Trp Leu Ser Met Asn Val Leu Leu Phe Trp Lys
                20              25              30


Thr Phe Leu Leu Tyr Asn Gln Gly Pro Glu Tyr His Tyr Leu His Gln
```

```
              35                          40                          45


Met Leu Gly Leu Gly Leu Cys Leu Ser Arg Ala Ser Ala Ser Val Leu
    50                  55                  60

Asn Leu Asn Cys Ser Leu Ile Leu Leu Pro Met Cys Arg Thr Leu Leu
65                  70                  75                      80

Ala Tyr Leu Arg Gly Ser Gln Lys Val Pro Ser Arg Arg Thr Arg Arg
                85                  90                  95

Leu Leu Asp Lys Ser Arg Thr Phe His Ile Thr Cys Gly Val Thr Ile
            100                 105                 110

Cys Ile Phe Ser Gly Val His Val Ala Ala His Leu Val Asn Ala Leu
        115                 120                 125

Asn Phe Ser Val Asn Tyr Ser Glu Asp Phe Val Glu Leu Asn Ala Ala
    130                 135                 140

Arg Tyr Arg Asp Glu Asp Pro Arg Lys Leu Leu Phe Thr Thr Val Pro
145                 150                 155                     160

Gly Leu Thr Gly Val Cys Met Val Val Leu Phe Leu Met Ile Thr
                165                 170                 175

Ala Ser Thr Tyr Ala Ile Arg Val Ser Asn Tyr Asp Ile Phe Trp Tyr
            180                 185                 190

Thr His Asn Leu Phe Phe Val Phe Tyr Met Leu Leu Thr Leu His Val
            195                 200                 205

Ser Gly Gly Leu Leu Lys Tyr Gln Thr Asn Leu Asp Thr His Pro Pro
    210                 215                 220

Gly Cys Ile Ser Leu Asn Arg Thr Ser Ser Gln Asn Ile Ser Leu Pro
225                 230                 235                     240

Glu Tyr Phe Ser Glu His Phe His Glu Pro Phe Pro Glu Gly Phe Ser
            245                 250                 255
```

```
Lys Pro Ala Glu Phe Thr Gln His Lys Phe Val Lys Ile Cys Met Glu
            260                 265             270

Glu Pro Arg Phe Gln Ala Asn Phe Pro Gln Thr Trp Leu Trp Ile Ser
            275                 280             285

Gly Pro Leu Cys Leu Tyr Cys Ala Glu Arg Leu Tyr Arg Tyr Ile Arg
            290                 295             300

Ser Asn Lys Pro Val Thr Ile Ile Ser Val Ile Ser His Pro Ser Asp
305                 310                 315                 320

Val Met Glu Ile Arg Met Val Lys Glu Asn Phe Lys Ala Arg Pro Gly
                325                 330             335

Gln Tyr Ile Thr Leu His Cys Pro Ser Val Ser Ala Leu Glu Asn His
            340                 345                 350

Pro Phe Thr Leu Thr Met Cys Pro Thr Glu Thr Lys Ala Thr Phe Gly
            355                 360                 365

Val His Leu Lys Ile Val Gly Asp Trp Thr Glu Arg Phe Arg Asp Leu
    370                 375                 380

Leu Leu Pro Pro Ser Ser Gln Asp Ser Glu Ile Leu Pro Phe Ile Gln
385                 390                 395                 400

Ser Arg Asn Tyr Pro Lys Leu Tyr Ile Asp Gly Pro Phe Gly Ser Pro
                405                 410                 415

Phe Glu Glu Ser Leu Asn Tyr Glu Val Ser Leu Cys Val Ala Gly Gly
            420                 425                 430

Ile Gly Val Thr Pro Phe Ala Ser Ile Leu Asn Thr Leu Leu Asp Asp
            435                 440                 445

Trp Lys Pro Tyr Lys Leu Arg Arg Leu Tyr Phe Ile Trp Val Cys Arg
    450                 455                 460

Asp Ile Gln Ser Phe Arg Trp Phe Ala Asp Leu Leu Cys Met Leu His
465                 470                 475                 480
```

```
Asn Lys Phe Trp Gln Glu Asn Arg Pro Asp Tyr Val Asn Ile Gln Leu
            485                 490                 495


Tyr Leu Ser Gln Thr Asp Gly Ile Gln Lys Ile Ile Gly Glu Lys Tyr
            500                 505                 510


His Ala Leu Asn Ser Arg Leu Phe Ile Gly Arg Pro Arg Trp Lys Leu
            515                 520                 525


Leu Phe Asp Glu Ile Ala Lys Tyr Asn Arg Gly Lys Thr Val Gly Val
            530                 535                 540


Phe Cys Cys Gly Pro Asn Ser Leu Ser Lys Thr Leu His Lys Leu Ser
545                 550                 555                 560


Asn Gln Asn Asn Ser Tyr Gly Thr Arg Phe Glu Tyr Asn Lys Glu Ser
                565                 570                 575


Phe Ser
```

```
<210>  9
<211>  2223
<212>  DNA
<213>  Homo sapiens


<220>
<221>  CDS
<222>  (73)..(1770)

<400>  9
gccgacgcgg acggcaacgg ggccatcacc ttcgaggagc tccgggacga gctgcagcgc      60

ttccccggag tc atg gag aac ctg acc atc agc act gcc cac tgg ctg acg     111
              Met Glu Asn Leu Thr Ile Ser Thr Ala His Trp Leu Thr
               1               5                  10

gcc ccc gcc ccc cgc cca cgc ccg cgc cgg ccg cgc cag ctg acc cgc      159
Ala Pro Ala Pro Arg Pro Arg Pro Arg Arg Pro Arg Gln Leu Thr Arg
        15                  20                  25

gcc tac tgg cac aac cac cgc agc cag ctg ttc tgc ctg gcc acc tat      207
Ala Tyr Trp His Asn His Arg Ser Gln Leu Phe Cys Leu Ala Thr Tyr
30                  35                  40                  45

gca ggc ctc cac gtg ctg ctc ttc ggg ctg gcg gcc agc gcg cac cgg      255
```

```
Ala Gly Leu His Val Leu Leu Phe Gly Leu Ala Ala Ser Ala His Arg
                50              55              60

gac ctc ggc gcc agc gtc atg gtg gcc aag ggc tgt ggc cag tgc ctc      303
Asp Leu Gly Ala Ser Val Met Val Ala Lys Gly Cys Gly Gln Cys Leu
            65              70              75

aac ttc gac tgc agc ttc atc gcg gtg ctg atg ctc aga cgc tgc ctc      351
Asn Phe Asp Cys Ser Phe Ile Ala Val Leu Met Leu Arg Arg Cys Leu
            80              85              90

acc tgg ctg cgg gcc acg tgg ctg gct caa gtc cta cca ctg gac cag      399
Thr Trp Leu Arg Ala Thr Trp Leu Ala Gln Val Leu Pro Leu Asp Gln
    95              100             105

aac atc cag ttc cac cag ctt atg ggc tac gtg gta gtg ggg ctg tcc      447
Asn Ile Gln Phe His Gln Leu Met Gly Tyr Val Val Val Gly Leu Ser
110             115             120             125

ctc gtg cac act gtg gct cac act gtg aac ttt gta ctc cag gct cag      495
Leu Val His Thr Val Ala His Thr Val Asn Phe Val Leu Gln Ala Gln
            130             135             140

gcg gag gcc agc cct ttc cag ttc tgg gag ctg ctg ctc acc acg agg      543
Ala Glu Ala Ser Pro Phe Gln Phe Trp Glu Leu Leu Leu Thr Thr Arg
            145             150             155

cct ggc att ggc tgg gta cac ggt tcg gcc tcc ccg aca ggt gtc gct      591
Pro Gly Ile Gly Trp Val His Gly Ser Ala Ser Pro Thr Gly Val Ala
            160             165             170

ctg ctg ctg ctg ctc ctc ctc atg ttc atc tgc tcc agt tcc tgc atc      639
Leu Leu Leu Leu Leu Leu Leu Met Phe Ile Cys Ser Ser Ser Cys Ile
    175             180             185

cgc agg agt ggc cac ttt gag gtg ttc tat tgg act cac ctg tcc tac      687
Arg Arg Ser Gly His Phe Glu Val Phe Tyr Trp Thr His Leu Ser Tyr
190             195             200             205

ctc ctc gtg tgg ctt ctg ctc atc ttt cat ggg ccc aac ttc tgg aag      735
Leu Leu Val Trp Leu Leu Leu Ile Phe His Gly Pro Asn Phe Trp Lys
            210             215             220

tgg ctg ctg gtg cct gga atc ttg ttt ttc ctg gag aag gcc atc gga      783
Trp Leu Leu Val Pro Gly Ile Leu Phe Phe Leu Glu Lys Ala Ile Gly
            225             230             235

ctg gca gtg tcc cgc atg gca gcc gtg tgc atc atg gaa gtc aac ctc      831
Leu Ala Val Ser Arg Met Ala Ala Val Cys Ile Met Glu Val Asn Leu
            240             245             250

ctc ccc tcc aag gtc act cat ctc ctc atc aag cgg ccc cct ttt ttt      879
Leu Pro Ser Lys Val Thr His Leu Leu Ile Lys Arg Pro Pro Phe Phe
    255             260             265
```

```
cac tat aga cct ggt gac tac ttg tat ctg aac atc ccc acc att gct      927
His Tyr Arg Pro Gly Asp Tyr Leu Tyr Leu Asn Ile Pro Thr Ile Ala
270             275             280                 285

cgc tat gag tgg cac ccc ttc acc atc agc agt gct cct gag cag aaa      975
Arg Tyr Glu Trp His Pro Phe Thr Ile Ser Ser Ala Pro Glu Gln Lys
                290             295             300

gac act atc tgg ctg cac att cgg tcc caa ggc cag tgg aca aac agg     1023
Asp Thr Ile Trp Leu His Ile Arg Ser Gln Gly Gln Trp Thr Asn Arg
            305             310             315

ctg tat gag tcc ttc aag gca tca gac cca ctg ggc cgt ggt tct aag     1071
Leu Tyr Glu Ser Phe Lys Ala Ser Asp Pro Leu Gly Arg Gly Ser Lys
            320             325             330

agg ctg tcg agg agt gtg aca atg aga aag agt caa agg tcg tcc aag     1119
Arg Leu Ser Arg Ser Val Thr Met Arg Lys Ser Gln Arg Ser Ser Lys
    335             340             345

ggc tct gag ata ctt ttg gag aaa cac aaa ttc tgt aac atc aag tgc     1167
Gly Ser Glu Ile Leu Leu Glu Lys His Lys Phe Cys Asn Ile Lys Cys
350             355             360                 365

tac atc gat ggg cct tat ggg acc ccc acc cgc agg atc ttt gcc tct     1215
Tyr Ile Asp Gly Pro Tyr Gly Thr Pro Thr Arg Arg Ile Phe Ala Ser
                370             375             380

gag cat gcc gtg ctc atc ggg gca ggc atc ggc atc acc ccc ttt gct     1263
Glu His Ala Val Leu Ile Gly Ala Gly Ile Gly Ile Thr Pro Phe Ala
            385             390             395

tcc att ctg cag agt atc atg tac agg cac cag aaa aga aag cat act     1311
Ser Ile Leu Gln Ser Ile Met Tyr Arg His Gln Lys Arg Lys His Thr
            400             405             410

tgc ccc agc tgc cag cac tcc tgg atc gaa ggt gtc caa gac aac atg     1359
Cys Pro Ser Cys Gln His Ser Trp Ile Glu Gly Val Gln Asp Asn Met
    415             420             425

aag ctc cat aag gtg gac ttt atc tgg atc aac aga gac cag cgg tct     1407
Lys Leu His Lys Val Asp Phe Ile Trp Ile Asn Arg Asp Gln Arg Ser
430             435             440                 445

ttc gag tgg ttt gtg agc ctg ctg act aaa ctg gag atg gac cag gcc     1455
Phe Glu Trp Phe Val Ser Leu Leu Thr Lys Leu Glu Met Asp Gln Ala
                450             455             460

gag gag gct caa tac ggc cgc ttc ctg gag ctg cat atg tac atg aca     1503
Glu Glu Ala Gln Tyr Gly Arg Phe Leu Glu Leu His Met Tyr Met Thr
                465             470             475

tct gca ctg ggc aag aat gac atg aag gcc att ggc ctg cag atg gcc     1551
Ser Ala Leu Gly Lys Asn Asp Met Lys Ala Ile Gly Leu Gln Met Ala
            480             485             490
```

```
ctt gac ctc ctg gcc aac aag gag aag aaa gac tcc atc acg ggg ctg      1599
Leu Asp Leu Leu Ala Asn Lys Glu Lys Lys Asp Ser Ile Thr Gly Leu
    495             500             505

cag acg cgc acc cag cct ggg cgg cct gac tgg agc aag gtg ttc cag      1647
Gln Thr Arg Thr Gln Pro Gly Arg Pro Asp Trp Ser Lys Val Phe Gln
510             515             520             525

aaa gtg gct gct gag aag aag ggc aag gtg cag gtc ttc ttc tgt ggc      1695
Lys Val Ala Ala Glu Lys Lys Gly Lys Val Gln Val Phe Phe Cys Gly
            530             535             540

tcc cca gct ctg gcc aag gtg ctg aag ggc cat tgt gag aag ttc ggc      1743
Ser Pro Ala Leu Ala Lys Val Leu Lys Gly His Cys Glu Lys Phe Gly
        545             550             555

ttc aga ttt ttc caa gag aat ttc tag cctcacctct ccaagctctg           1790
Phe Arg Phe Phe Gln Glu Asn Phe
        560             565

ccccaagtcc acaccatggg tctgcttcat cgcattagta taaatgcccc cacagggacc   1850

agcctcagat gacccaccca ataagacaaa gcctagggac ccctaatcc tgctcaacag     1910

agagaacagg agaccccaag gggcagatga acttcctcta gaacccaggg gaaggggcag    1970

tgccttgttc agtctgctgt agattctggg gtttctgtga aagtgaggga accagaggct    2030

ggtcacggga gcttgggggt ggggttcgag ggggcagagg gcaaccactc ctccaaacat    2090

tttccgacgg agccttcccc cacatccatg gtcccaaacc tgcccaatca tcacagtcat    2150

ttggaagctt atttctccgg catcttataa aattgttcaa acctacagta aaaaaaaaaa    2210

aaaaaaaaaa aaa                                                        2223


<210>  10
<211>  565
<212>  PRT
<213>  Homo sapiens

<400>  10

Met Glu Asn Leu Thr Ile Ser Thr Ala His Trp Leu Thr Ala Pro Ala
1               5               10              15


Pro Arg Pro Arg Pro Arg Arg Pro Arg Gln Leu Thr Arg Ala Tyr Trp
            20              25              30


His Asn His Arg Ser Gln Leu Phe Cys Leu Ala Thr Tyr Ala Gly Leu
        35              40              45
```

```
His Val Leu Leu Phe Gly Leu Ala Ala Ser Ala His Arg Asp Leu Gly
    50              55              60

Ala Ser Val Met Val Ala Lys Gly Cys Gly Gln Cys Leu Asn Phe Asp
65              70              75                  80

Cys Ser Phe Ile Ala Val Leu Met Leu Arg Arg Cys Leu Thr Trp Leu
            85              90              95

Arg Ala Thr Trp Leu Ala Gln Val Leu Pro Leu Asp Gln Asn Ile Gln
            100             105             110

Phe His Gln Leu Met Gly Tyr Val Val Val Gly Leu Ser Leu Val His
        115             120             125

Thr Val Ala His Thr Val Asn Phe Val Leu Gln Ala Gln Ala Glu Ala
    130             135             140

Ser Pro Phe Gln Phe Trp Glu Leu Leu Leu Thr Thr Arg Pro Gly Ile
145             150             155             160

Gly Trp Val His Gly Ser Ala Ser Pro Thr Gly Val Ala Leu Leu Leu
            165             170             175

Leu Leu Leu Leu Met Phe Ile Cys Ser Ser Ser Cys Ile Arg Arg Ser
        180             185             190

Gly His Phe Glu Val Phe Tyr Trp Thr His Leu Ser Tyr Leu Leu Val
        195             200             205

Trp Leu Leu Leu Ile Phe His Gly Pro Asn Phe Trp Lys Trp Leu Leu
    210             215             220

Val Pro Gly Ile Leu Phe Phe Leu Glu Lys Ala Ile Gly Leu Ala Val
225             230             235             240

Ser Arg Met Ala Ala Val Cys Ile Met Glu Val Asn Leu Leu Pro Ser
            245             250             255

Lys Val Thr His Leu Leu Ile Lys Arg Pro Pro Phe Phe His Tyr Arg
```

```
                  260                      265                      270


  Pro Gly Asp Tyr Leu Tyr Leu Asn Ile Pro Thr Ile Ala Arg Tyr Glu
          275                 280                 285


  Trp His Pro Phe Thr Ile Ser Ser Ala Pro Glu Gln Lys Asp Thr Ile
          290                 295                 300


  Trp Leu His Ile Arg Ser Gln Gly Gln Trp Thr Asn Arg Leu Tyr Glu
  305                 310                 315                 320


  Ser Phe Lys Ala Ser Asp Pro Leu Gly Arg Gly Ser Lys Arg Leu Ser
                  325                 330                 335


  Arg Ser Val Thr Met Arg Lys Ser Gln Arg Ser Ser Lys Gly Ser Glu
              340                 345                 350


  Ile Leu Leu Glu Lys His Lys Phe Cys Asn Ile Lys Cys Tyr Ile Asp
          355                 360                 365


  Gly Pro Tyr Gly Thr Pro Thr Arg Arg Ile Phe Ala Ser Glu His Ala
      370                 375                 380


  Val Leu Ile Gly Ala Gly Ile Gly Ile Thr Pro Phe Ala Ser Ile Leu
  385                 390                 395                 400


  Gln Ser Ile Met Tyr Arg His Gln Lys Arg Lys His Thr Cys Pro Ser
                  405                 410                 415


  Cys Gln His Ser Trp Ile Glu Gly Val Gln Asp Asn Met Lys Leu His
              420                 425                 430


  Lys Val Asp Phe Ile Trp Ile Asn Arg Asp Gln Arg Ser Phe Glu Trp
          435                 440                 445


  Phe Val Ser Leu Leu Thr Lys Leu Glu Met Asp Gln Ala Glu Glu Ala
          450                 455                 460


  Gln Tyr Gly Arg Phe Leu Glu Leu His Met Tyr Met Thr Ser Ala Leu
  465                 470                 475                 480
```

```
Gly Lys Asn Asp Met Lys Ala Ile Gly Leu Gln Met Ala Leu Asp Leu
            485             490             495
```

```
Leu Ala Asn Lys Glu Lys Lys Asp Ser Ile Thr Gly Leu Gln Thr Arg
            500             505             510
```

```
Thr Gln Pro Gly Arg Pro Asp Trp Ser Lys Val Phe Gln Lys Val Ala
            515             520             525
```

```
Ala Glu Lys Lys Gly Lys Val Gln Val Phe Phe Cys Gly Ser Pro Ala
        530             535             540
```

```
Leu Ala Lys Val Leu Lys Gly His Cys Glu Lys Phe Gly Phe Arg Phe
545             550             555             560
```

```
Phe Gln Glu Asn Phe
            565
```

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<210>  11
<211>  5693
<212>  DNA
<213>  Homo sapiens
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<221>  CDS
<222>  (347)..(5002)
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gcagagctgc agaggcaccg gacgagagag ggctccgcgg gcccagctgg cagccaggcc      60

ggagacaagt tgcagtcccg ggctctggtg acgccgtggc cgcagctgga agaggaaaac     120

aaggatcaga ttggagaagt gatttatcta agatcccaca gtggactggc agcagcactg     180

agacctcagc ctagtctcct gatccccaag cagggccctg cctaaggaac acactctgca     240

gagtgctggg ccaaagcagg gttttccaac taatcttaga aggtaaagtc catgaagggt     300

ctccattttg ggacattcta atccctgagc ccctattatt ttcatc atg ggc ttc       355
                                                   Met Gly Phe
                                                    1

tgc ctg gct cta gca tgg aca ctt ctg gtt ggg gca tgg acc cct ctg      403
Cys Leu Ala Leu Ala Trp Thr Leu Leu Val Gly Ala Trp Thr Pro Leu
    5                   10                  15

gga gct cag aac ccc att tcg tgg gag gtg cag cga ttt gat ggg tgg      451
Gly Ala Gln Asn Pro Ile Ser Trp Glu Val Gln Arg Phe Asp Gly Trp
```

```
        20                       25                       30                       35

tac aac aac ctc atg gag cac aga tgg ggc agc aaa ggc tcc cgg ctg      499
Tyr Asn Asn Leu Met Glu His Arg Trp Gly Ser Lys Gly Ser Arg Leu
                40                      45                      50

cag cgc ctg gtc cca gcc agc tat gca gat ggc gtg tac cag ccc ttg      547
Gln Arg Leu Val Pro Ala Ser Tyr Ala Asp Gly Val Tyr Gln Pro Leu
            55                      60                      65

gga gaa ccc cac ctg ccc aac ccc cga gac ctt agc aac acc atc tca      595
Gly Glu Pro His Leu Pro Asn Pro Arg Asp Leu Ser Asn Thr Ile Ser
            70                      75                      80

agg ggc cct gca ggg ctg gcc tcc ctg aga aac cgc aca gtg ttg ggg      643
Arg Gly Pro Ala Gly Leu Ala Ser Leu Arg Asn Arg Thr Val Leu Gly
        85                      90                      95

gtc ttc ttt ggc tat cac gtg ctt tca gac ctg gtg agc gtg gaa act      691
Val Phe Phe Gly Tyr His Val Leu Ser Asp Leu Val Ser Val Glu Thr
100                     105                     110                     115

ccc ggc tgc ccc gcc gag ttc ctc aac att cgc atc ccg ccc gga gac      739
Pro Gly Cys Pro Ala Glu Phe Leu Asn Ile Arg Ile Pro Pro Gly Asp
                120                     125                     130

ccc atg ttc gac ccc gac cag cgc ggg gac gtg gtg ctg ccc ttc cag      787
Pro Met Phe Asp Pro Asp Gln Arg Gly Asp Val Val Leu Pro Phe Gln
                135                     140                     145

aga agc cgc tgg gac ccc gag acc gga cgg agt ccc agc aat ccc cgg      835
Arg Ser Arg Trp Asp Pro Glu Thr Gly Arg Ser Pro Ser Asn Pro Arg
            150                     155                     160

gac ccg gcc aac cag gtg acg ggc tgg ctg gac ggc agc gcc atc tat      883
Asp Pro Ala Asn Gln Val Thr Gly Trp Leu Asp Gly Ser Ala Ile Tyr
        165                     170                     175

ggt tcc tcg cat tcc tgg agc gac gcg ctg cgg agc ttc tcc agg gga      931
Gly Ser Ser His Ser Trp Ser Asp Ala Leu Arg Ser Phe Ser Arg Gly
180                     185                     190                     195

cag ctg gcg tcg ggg ccc gac ccc gct ttt ccc cga gac tcg cag aac      979
Gln Leu Ala Ser Gly Pro Asp Pro Ala Phe Pro Arg Asp Ser Gln Asn
                200                     205                     210

ccc ctg ctc atg tgg gcg gcg ccc gac ccc gcc acc ggg cag aac ggg     1027
Pro Leu Leu Met Trp Ala Ala Pro Asp Pro Ala Thr Gly Gln Asn Gly
                215                     220                     225

ccc cgg ggg ctg tac gcc ttc ggg gca gag aga ggg aac cgg gaa ccc     1075
Pro Arg Gly Leu Tyr Ala Phe Gly Ala Glu Arg Gly Asn Arg Glu Pro
                230                     235                     240

ttc ctg cag gcg ctg ggc ctg ctc tgg ttc cgc tac cac aac ctg tgg     1123
```

```
Phe Leu Gln Ala Leu Gly Leu Leu Trp Phe Arg Tyr His Asn Leu Trp
    245             250             255
```

```
gcg cag agg ctg gcc cgc cag cac cca gac tgg gag gac gag gag ctg    1171
Ala Gln Arg Leu Ala Arg Gln His Pro Asp Trp Glu Asp Glu Glu Leu
260             265             270             275
```

```
ttc cag cac gca cgc aag agg gtc atc gcc acc tac cag aac atc gct    1219
Phe Gln His Ala Arg Lys Arg Val Ile Ala Thr Tyr Gln Asn Ile Ala
                280             285             290
```

```
gtg tat gag tgg ctg ccc agc ttc ctg cag aaa aca ctc ccg gag tat    1267
Val Tyr Glu Trp Leu Pro Ser Phe Leu Gln Lys Thr Leu Pro Glu Tyr
            295             300             305
```

```
aca gga tac cgg cca ttt ctg gac ccc agc atc tcc tca gag ttc gtg    1315
Thr Gly Tyr Arg Pro Phe Leu Asp Pro Ser Ile Ser Ser Glu Phe Val
            310             315             320
```

```
gcg gcc tct gag cag ttc ctg tcc acc atg gtg ccc cct ggc gtc tac    1363
Ala Ala Ser Glu Gln Phe Leu Ser Thr Met Val Pro Pro Gly Val Tyr
    325             330             335
```

```
atg aga aat gcc agc tgc cac ttc cag ggg gtc atc aat cgg aac tca    1411
Met Arg Asn Ala Ser Cys His Phe Gln Gly Val Ile Asn Arg Asn Ser
340             345             350             355
```

```
agt gtc tcc aga gct ctc cgg gtc tgc aac agc tac tgg agc cgt gag    1459
Ser Val Ser Arg Ala Leu Arg Val Cys Asn Ser Tyr Trp Ser Arg Glu
            360             365             370
```

```
cac cca agc cta caa agt gct gaa gat gtg gat gca ctg ctg ctg ggc    1507
His Pro Ser Leu Gln Ser Ala Glu Asp Val Asp Ala Leu Leu Leu Gly
            375             380             385
```

```
atg gcc tcc cag atc gca gag cga gag gac cat gtg ttg gtt gaa gat    1555
Met Ala Ser Gln Ile Ala Glu Arg Glu Asp His Val Leu Val Glu Asp
            390             395             400
```

```
gtg cgg gat ttc tgg cct ggg cca ctg aag ttt tcc cgc aca gac cac    1603
Val Arg Asp Phe Trp Pro Gly Pro Leu Lys Phe Ser Arg Thr Asp His
            405             410             415
```

```
ctg gcc agc tgc ctg cag cgg ggc cgg gat ctg ggc ctg ccc tct tac    1651
Leu Ala Ser Cys Leu Gln Arg Gly Arg Asp Leu Gly Leu Pro Ser Tyr
420             425             430             435
```

```
acc aag gcc agg gca gca ctg ggc ttg tct ccc att acc cgc tgg cag    1699
Thr Lys Ala Arg Ala Ala Leu Gly Leu Ser Pro Ile Thr Arg Trp Gln
                440             445             450
```

```
gac atc aac cct gca ctc tcc cgg agc aat gac act gta ctg gag gcc    1747
Asp Ile Asn Pro Ala Leu Ser Arg Ser Asn Asp Thr Val Leu Glu Ala
            455             460             465
```

```
aca gct gcc ctg tac aac cag gac tta tcc tgg cta gag ctg ctc cct      1795
Thr Ala Ala Leu Tyr Asn Gln Asp Leu Ser Trp Leu Glu Leu Leu Pro
        470             475             480

ggg gga ctc ctg gag agc cac cgg gac cct gga cct ctg ttc agc acc      1843
Gly Gly Leu Leu Glu Ser His Arg Asp Pro Gly Pro Leu Phe Ser Thr
        485             490             495

atc gtc ctt gaa caa ttt gtg cgg cta cgg gat ggt gac cgc tac tgg      1891
Ile Val Leu Glu Gln Phe Val Arg Leu Arg Asp Gly Asp Arg Tyr Trp
500             505             510             515

ttt gag aac acc agg aat ggg ctg ttc tcc aag aag gag att gaa gaa      1939
Phe Glu Asn Thr Arg Asn Gly Leu Phe Ser Lys Lys Glu Ile Glu Glu
                520             525             530

atc cga aat acc acc ctg cag gac gtg ctg gtc gct gtt atc aac att      1987
Ile Arg Asn Thr Thr Leu Gln Asp Val Leu Val Ala Val Ile Asn Ile
        535             540             545

gac ccc agt gct ctg cag ccc aat gtc ttt gtc tgg cat aaa gga gac      2035
Asp Pro Ser Ala Leu Gln Pro Asn Val Phe Val Trp His Lys Gly Asp
        550             555             560

ccc tgt ccg cag ccg aga cag ctc agc act gaa ggc ctg cca gcg tgt      2083
Pro Cys Pro Gln Pro Arg Gln Leu Ser Thr Glu Gly Leu Pro Ala Cys
        565             570             575

gct ccc tct gtt gtt cgt gac tat ttt gag ggc agt gga ttt ggc ttc      2131
Ala Pro Ser Val Val Arg Asp Tyr Phe Glu Gly Ser Gly Phe Gly Phe
580             585             590             595

ggg gtc acc atc ggg acc ctc tgt tgc ttc cct ttg gtg agc ctg ctc      2179
Gly Val Thr Ile Gly Thr Leu Cys Cys Phe Pro Leu Val Ser Leu Leu
                600             605             610

agt gcc tgg att gtt gcc cgg ctc cgg atg aga aat ttc aag agg ctc      2227
Ser Ala Trp Ile Val Ala Arg Leu Arg Met Arg Asn Phe Lys Arg Leu
                615             620             625

cag ggc cag gac cgc cag agc atc gtg tct gag aag ctc gtg gga ggc      2275
Gln Gly Gln Asp Arg Gln Ser Ile Val Ser Glu Lys Leu Val Gly Gly
        630             635             640

atg gaa gct ttg gaa tgg caa ggc cac aag gag ccc tgc cgg ccc gtg      2323
Met Glu Ala Leu Glu Trp Gln Gly His Lys Glu Pro Cys Arg Pro Val
        645             650             655

ctt gtg tac ctg cag ccc ggg cag atc cgt gtg gta gat ggc agg ctc      2371
Leu Val Tyr Leu Gln Pro Gly Gln Ile Arg Val Val Asp Gly Arg Leu
660             665             670             675

acc gtg ctc cgc acc atc cag ctg cag cct cca cag aag gtc aac ttc      2419
Thr Val Leu Arg Thr Ile Gln Leu Gln Pro Pro Gln Lys Val Asn Phe
        680             685             690
```

```
gtc ctg tcc agc aac cgt gga cgc cgc act ctg ctg ctc aag atc ccc        2467
Val Leu Ser Ser Asn Arg Gly Arg Arg Thr Leu Leu Leu Lys Ile Pro
            695             700             705

aag gag tat gac ctg gtg ctg ctg ttt aac ttg gag gaa gag cgg cag        2515
Lys Glu Tyr Asp Leu Val Leu Leu Phe Asn Leu Glu Glu Glu Arg Gln
            710             715             720

gcg ctg gtg gaa aat ctc cgg gga gct ctg aag gag agc ggg ttg agc        2563
Ala Leu Val Glu Asn Leu Arg Gly Ala Leu Lys Glu Ser Gly Leu Ser
            725             730             735

atc cag gag tgg gag ctg cgg gag cag gag ctg atg aga gca gct gtg        2611
Ile Gln Glu Trp Glu Leu Arg Glu Gln Glu Leu Met Arg Ala Ala Val
740             745             750             755

aca cgg gag cag cgg agg cac ctc ctg gag acc ttt ttc agg cac ctt        2659
Thr Arg Glu Gln Arg Arg His Leu Leu Glu Thr Phe Phe Arg His Leu
                760             765             770

ttc tcc cag gtg ctg gac atc aac cag gcc gac gca ggg acc ctg ccc        2707
Phe Ser Gln Val Leu Asp Ile Asn Gln Ala Asp Ala Gly Thr Leu Pro
                775             780             785

ctg gac tcc tcc cag aag gtg cgg gag gcc ctg acc tgt gag ctg agc        2755
Leu Asp Ser Ser Gln Lys Val Arg Glu Ala Leu Thr Cys Glu Leu Ser
            790             795             800

agg gcc gag ttt gcc gag tcc ctg ggc ctc aag ccc cag gac atg ttt        2803
Arg Ala Glu Phe Ala Glu Ser Leu Gly Leu Lys Pro Gln Asp Met Phe
            805             810             815

gtg gag tcc atg ttc tct ctg gct gac aag gat ggc aat ggc tac ctg        2851
Val Glu Ser Met Phe Ser Leu Ala Asp Lys Asp Gly Asn Gly Tyr Leu
820             825             830             835

tcc ttc cga gag ttc ctg gac atc ctg gtg gtc ttc atg aaa ggc tct        2899
Ser Phe Arg Glu Phe Leu Asp Ile Leu Val Val Phe Met Lys Gly Ser
                840             845             850

cct gag gaa aag tct cgc ctt atg ttc cgc atg tac gac ttt gat ggg        2947
Pro Glu Glu Lys Ser Arg Leu Met Phe Arg Met Tyr Asp Phe Asp Gly
            855             860             865

aat ggc ctc att tcc aag gat gag ttc atc agg atg ctg aga tcc ttc        2995
Asn Gly Leu Ile Ser Lys Asp Glu Phe Ile Arg Met Leu Arg Ser Phe
            870             875             880

atc gag atc tcc aac aac tgc ctg tcc aag gcc cag ctg gct gag gtg        3043
Ile Glu Ile Ser Asn Asn Cys Leu Ser Lys Ala Gln Leu Ala Glu Val
            885             890             895

gtg gag tcc atg ttc cgg gag tcg gga ttc cag gac aag gag gaa ctg        3091
Val Glu Ser Met Phe Arg Glu Ser Gly Phe Gln Asp Lys Glu Glu Leu
```

```
           900                        905                        910                        915

aca tgg gaa gat ttt cac ttc atg ctg cgg gac cac aat agc gag ctc        3139
Thr Trp Glu Asp Phe His Phe Met Leu Arg Asp His Asn Ser Glu Leu
                    920                     925                     930

cgc ttc acg cag ctc tgt gtc aaa ggg gtg gag gtg cct gaa gtc atc        3187
Arg Phe Thr Gln Leu Cys Val Lys Gly Val Glu Val Pro Glu Val Ile
            935                     940                     945

aag gac ctc tgc cgg cga gcc tcc tac atc agc cag gat atg atc tgt        3235
Lys Asp Leu Cys Arg Arg Ala Ser Tyr Ile Ser Gln Asp Met Ile Cys
            950                     955                     960

ccc tct ccc aga gtg agt gcc cgc tgt tcc cgc agc gac att gag act        3283
Pro Ser Pro Arg Val Ser Ala Arg Cys Ser Arg Ser Asp Ile Glu Thr
        965                     970                     975

gag ttg aca cct cag aga ctg cag tgc ccc atg gac aca gac cct ccc        3331
Glu Leu Thr Pro Gln Arg Leu Gln Cys Pro Met Asp Thr Asp Pro Pro
980                     985                     990                     995

cag gag att cgg cgg  agg ttt ggc aag aag  gta acg tca ttc cag        3376
Gln Glu Ile Arg Arg  Arg Phe Gly Lys Lys  Val Thr Ser Phe Gln
            1000                    1005                    1010

ccc ttg ctg ttc act  gag gcg cac cga gag  aag ttc caa cgc agc        3421
Pro Leu Leu Phe Thr  Glu Ala His Arg Glu  Lys Phe Gln Arg Ser
            1015                    1020                    1025

tgt ctc cac cag acg  gtg caa cag ttc aag  cgc ttc att gag aac        3466
Cys Leu His Gln Thr  Val Gln Gln Phe Lys  Arg Phe Ile Glu Asn
            1030                    1035                    1040

tac cgg cgc cac atc  ggc tgc gtg gcc gtg  ttc tac gcc atc gct        3511
Tyr Arg Arg His Ile  Gly Cys Val Ala Val  Phe Tyr Ala Ile Ala
            1045                    1050                    1055

ggg ggg ctt ttc ctg  gag agg gcc tac tac  tac gcc ttt gcc gca        3556
Gly Gly Leu Phe Leu  Glu Arg Ala Tyr Tyr  Tyr Ala Phe Ala Ala
            1060                    1065                    1070

cat cac acg ggc atc  aca gac acc acc cgc  gtg gga atc atc ctg        3601
His His Thr Gly Ile  Thr Asp Thr Thr Arg  Val Gly Ile Ile Leu
            1075                    1080                    1085

tcg cgg ggc aca gca  gcc agc atc tct ttc  atg ttc tcc tac atc        3646
Ser Arg Gly Thr Ala  Ala Ser Ile Ser Phe  Met Phe Ser Tyr Ile
            1090                    1095                    1100

ttg ctc acc atg tgc  cgc aac ctc atc acc  ttc ctg cga gaa acc        3691
Leu Leu Thr Met Cys  Arg Asn Leu Ile Thr  Phe Leu Arg Glu Thr
            1105                    1110                    1115

ttc ctc aac cgc tac  gtg ccc ttc gac gcc  gcc gtg gac ttc cat        3736
```

```
Phe Leu Asn Arg Tyr  Val Pro Phe Asp Ala  Ala Val Asp Phe His
            1120              1125              1130
```

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cgc ctc att gcc tcc  acc gcc atc gtc ctc  aca gtc tta cac agt          3781
Arg Leu Ile Ala Ser  Thr Ala Ile Val Leu  Thr Val Leu His Ser
            1135              1140              1145
```

```
gtg ggc cat gtg gtg  aat gtg tac ctg ttc  tcc atc agc ccc ctc          3826
Val Gly His Val Val  Asn Val Tyr Leu Phe  Ser Ile Ser Pro Leu
            1150              1155              1160
```

```
agc gtc ctc tct tgc  ctc ttt cct ggc ctc  ttc cat gat gat ggg          3871
Ser Val Leu Ser Cys  Leu Phe Pro Gly Leu  Phe His Asp Asp Gly
            1165              1170              1175
```

```
tct gag ctc ccc cag  aag tat tac tgg tgg  ttc ttc cag acc gta          3916
Ser Glu Leu Pro Gln  Lys Tyr Tyr Trp Trp  Phe Phe Gln Thr Val
            1180              1185              1190
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```
cca ggc ctc acg ggg  gtt gtg ctg ctc ctg  atc ctg gcc atc atg          3961
Pro Gly Leu Thr Gly  Val Val Leu Leu Leu  Ile Leu Ala Ile Met
            1195              1200              1205
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tat gtc ttt gcc tcc  cac cac ttc cgc cgc  cgc agt ttc cgg ggc          4006
Tyr Val Phe Ala Ser  His His Phe Arg Arg  Arg Ser Phe Arg Gly
            1210              1215              1220
```

```
ttc tgg ctg acc cac  cac ctc tac atc ctg  ctc tat gtc ctg ctc          4051
Phe Trp Leu Thr His  His Leu Tyr Ile Leu  Leu Tyr Val Leu Leu
            1225              1230              1235
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atc atc cat ggt agc  ttt gcc ctg atc cag  ctg ccc cgt ttc cac          4096
Ile Ile His Gly Ser  Phe Ala Leu Ile Gln  Leu Pro Arg Phe His
            1240              1245              1250
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atc ttc ttc ctg gtc  cca gca atc atc tat  ggg ggc gac aag ctg          4141
Ile Phe Phe Leu Val  Pro Ala Ile Ile Tyr  Gly Gly Asp Lys Leu
            1255              1260              1265
```

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gtg agc ctg agc cgg  aag aag gtg gag atc  agc gtg gtg aag gcg          4186
Val Ser Leu Ser Arg  Lys Lys Val Glu Ile  Ser Val Val Lys Ala
            1270              1275              1280
```

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gag ctg ctg ccc tca  gga gtg acc cac ctg  cgg ttc cag cgg ccc          4231
Glu Leu Leu Pro Ser  Gly Val Thr His Leu  Arg Phe Gln Arg Pro
            1285              1290              1295
```

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cag ggc ttt gag tac  aag tca ggg cag tgg  gtg cgg atc gct tgc          4276
Gln Gly Phe Glu Tyr  Lys Ser Gly Gln Trp  Val Arg Ile Ala Cys
            1300              1305              1310
```

```
ctg gct ctg ggg acc  acc gag tac cac ccc  ttc aca ctg acc tct          4321
Leu Ala Leu Gly Thr  Thr Glu Tyr His Pro  Phe Thr Leu Thr Ser
            1315              1320              1325
```

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gcg ccc cat gag gac   acg ctt agc ctg cac   atc cgg gca gca ggg        4366
Ala Pro His Glu Asp   Thr Leu Ser Leu His   Ile Arg Ala Ala Gly
            1330                    1335                    1340

ccc tgg acc act cgc   ctc agg gag atc tac   tca gcc ccg acg ggt        4411
Pro Trp Thr Thr Arg   Leu Arg Glu Ile Tyr   Ser Ala Pro Thr Gly
            1345                    1350                    1355

gac aga tgt gcc aga   tac cca aag ctg tac   ctt gat gga cca ttt        4456
Asp Arg Cys Ala Arg   Tyr Pro Lys Leu Tyr   Leu Asp Gly Pro Phe
            1360                    1365                    1370

gga gag ggc cac cag   gag tgg cat aag ttt   gag gtg tca gtg tta        4501
Gly Glu Gly His Gln   Glu Trp His Lys Phe   Glu Val Ser Val Leu
            1375                    1380                    1385

gtg gga ggg ggc att   ggg gtc acc cct ttt   gcc tcc atc ctc aaa        4546
Val Gly Gly Gly Ile   Gly Val Thr Pro Phe   Ala Ser Ile Leu Lys
            1390                    1395                    1400

gac ctg gtc ttc aag   tca tcc gtc agc tgc   caa gtg ttc tgt aag        4591
Asp Leu Val Phe Lys   Ser Ser Val Ser Cys   Gln Val Phe Cys Lys
            1405                    1410                    1415

aag atc tac ttc atc   tgg gtg acg cgg acc   cag cgt cag ttt gag        4636
Lys Ile Tyr Phe Ile   Trp Val Thr Arg Thr   Gln Arg Gln Phe Glu
            1420                    1425                    1430

tgg ctg gct gac atc   atc cga gag gtg gag   gag aat gac cac cag        4681
Trp Leu Ala Asp Ile   Ile Arg Glu Val Glu   Glu Asn Asp His Gln
            1435                    1440                    1445

gac ctg gtg tct gtg   cac atc tac atc acc   cag ctg gct gag aag        4726
Asp Leu Val Ser Val   His Ile Tyr Ile Thr   Gln Leu Ala Glu Lys
            1450                    1455                    1460

ttc gac ctc agg acc   act atg ctg tac atc   tgt gag cgg cac ttc        4771
Phe Asp Leu Arg Thr   Thr Met Leu Tyr Ile   Cys Glu Arg His Phe
            1465                    1470                    1475

cag aag gtt ctg aac   cgg agt cta ttc aca   ggc ctg cgc tcc atc        4816
Gln Lys Val Leu Asn   Arg Ser Leu Phe Thr   Gly Leu Arg Ser Ile
            1480                    1485                    1490

acc cac ttt ggc cgt   ccc ccc ttt gag ccc   ttc ttc aac tcc ctg        4861
Thr His Phe Gly Arg   Pro Pro Phe Glu Pro   Phe Phe Asn Ser Leu
            1495                    1500                    1505

cag gag gtc cac ccc   cag gtc cgg aag atc   ggg gtg ttt agc tgt        4906
Gln Glu Val His Pro   Gln Val Arg Lys Ile   Gly Val Phe Ser Cys
            1510                    1515                    1520

ggc ccc cct ggc atg   acc aag aat gtg gaa   aag gcc tgt cag ctc        4951
Gly Pro Pro Gly Met   Thr Lys Asn Val Glu   Lys Ala Cys Gln Leu
            1525                    1530                    1535
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atc aac agg cag gac  cgg act cac ttc tcc  cac cat tat gag aac        4996
Ile Asn Arg Gln Asp  Arg Thr His Phe Ser  His His Tyr Glu Asn
                1540                 1545                 1550

ttc tag gcccctgccc gggggttctg cccactgccc agttgagcag aggtttgagc       5052
Phe


ccacacctca cctctgttct tcctatttct ggctgcctca gccttctctg atttcccacc    5112

tcccaacctt gttccaggtg gccatagtca gtcaccatgt gtgggctcag ggaccccag     5172

gaccaggatg tgtctcagcc tggagaaatg gtggggggc agtgtctagg gactagagtg    5232

agaagtaggg gagctactga tttggggcaa agtgaaacct ctgcttccag acttcagaaa    5292

caaatctcag aagacaagct gacctgacaa gtactatgtg tgtgcatgtc tgtatgtgtg    5352

ttggggcggt gagtgtaagg atgcagtggg agcatggatg ctggcatctt agaaccctcc    5412

ctactcccat acctcctcct cttctgggct ccccactgtc agacgggctg gcaaatgcct    5472

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gtctaacacc acaactaatt tcacccaagg ttttaagcac gttctttcat cagaccctgg    5592

cccaatacct atgtatgcaa tgctcctcag ccctcttctc cctgctccag tagtctccct    5652

tccaaataaa tcacttttct gccttaaaaa aaaaaaaaa a                         5693
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1               5                   10                  15


Thr Pro Leu Gly Ala Gln Asn Pro Ile Ser Trp Glu Val Gln Arg Phe
            20                  25                  30


Asp Gly Trp Tyr Asn Asn Leu Met Glu His Arg Trp Gly Ser Lys Gly
            35                  40                  45


Ser Arg Leu Gln Arg Leu Val Pro Ala Ser Tyr Ala Asp Gly Val Tyr
        50                  55                  60
```

```
Gln Pro Leu Gly Glu Pro His Leu Pro Asn Pro Arg Asp Leu Ser Asn
65              70              75                      80


Thr Ile Ser Arg Gly Pro Ala Gly Leu Ala Ser Leu Arg Asn Arg Thr
                85              90              95


Val Leu Gly Val Phe Phe Gly Tyr His Val Leu Ser Asp Leu Val Ser
            100             105             110


Val Glu Thr Pro Gly Cys Pro Ala Glu Phe Leu Asn Ile Arg Ile Pro
        115             120             125


Pro Gly Asp Pro Met Phe Asp Pro Asp Gln Arg Gly Asp Val Val Leu
    130             135             140


Pro Phe Gln Arg Ser Arg Trp Asp Pro Glu Thr Gly Arg Ser Pro Ser
145             150             155             160


Asn Pro Arg Asp Pro Ala Asn Gln Val Thr Gly Trp Leu Asp Gly Ser
            165             170             175


Ala Ile Tyr Gly Ser Ser His Ser Trp Ser Asp Ala Leu Arg Ser Phe
            180             185             190


Ser Arg Gly Gln Leu Ala Ser Gly Pro Asp Pro Ala Phe Pro Arg Asp
        195             200             205


Ser Gln Asn Pro Leu Leu Met Trp Ala Ala Pro Asp Pro Ala Thr Gly
    210             215             220


Gln Asn Gly Pro Arg Gly Leu Tyr Ala Phe Gly Ala Glu Arg Gly Asn
225             230             235             240


Arg Glu Pro Phe Leu Gln Ala Leu Gly Leu Leu Trp Phe Arg Tyr His
            245             250             255


Asn Leu Trp Ala Gln Arg Leu Ala Arg Gln His Pro Asp Trp Glu Asp
            260             265             270


Glu Glu Leu Phe Gln His Ala Arg Lys Arg Val Ile Ala Thr Tyr Gln
    275             280             285
```

Asn Ile Ala Val Tyr Glu Trp Leu Pro Ser Phe Leu Gln Lys Thr Leu
    290   295   300

Pro Glu Tyr Thr Gly Tyr Arg Pro Phe Leu Asp Pro Ser Ile Ser Ser
305   310   315   320

Glu Phe Val Ala Ala Ser Glu Gln Phe Leu Ser Thr Met Val Pro Pro
          325   330   335

Gly Val Tyr Met Arg Asn Ala Ser Cys His Phe Gln Gly Val Ile Asn
          340   345   350

Arg Asn Ser Ser Val Ser Arg Ala Leu Arg Val Cys Asn Ser Tyr Trp
      355   360   365

Ser Arg Glu His Pro Ser Leu Gln Ser Ala Glu Asp Val Asp Ala Leu
    370   375   380

Leu Leu Gly Met Ala Ser Gln Ile Ala Glu Arg Glu Asp His Val Leu
385   390   395   400

Val Glu Asp Val Arg Asp Phe Trp Pro Gly Pro Leu Lys Phe Ser Arg
          405   410   415

Thr Asp His Leu Ala Ser Cys Leu Gln Arg Gly Arg Asp Leu Gly Leu
          420   425   430

Pro Ser Tyr Thr Lys Ala Arg Ala Ala Leu Gly Leu Ser Pro Ile Thr
      435   440   445

Arg Trp Gln Asp Ile Asn Pro Ala Leu Ser Arg Ser Asn Asp Thr Val
    450   455   460

Leu Glu Ala Thr Ala Ala Leu Tyr Asn Gln Asp Leu Ser Trp Leu Glu
465   470   475   480

Leu Leu Pro Gly Gly Leu Leu Glu Ser His Arg Asp Pro Gly Pro Leu
          485   490   495

Phe Ser Thr Ile Val Leu Glu Gln Phe Val Arg Leu Arg Asp Gly Asp
      500   505   510

```
Arg Tyr Trp Phe Glu Asn Thr Arg Asn Gly Leu Phe Ser Lys Lys Glu
        515             520             525

Ile Glu Glu Ile Arg Asn Thr Thr Leu Gln Asp Val Leu Val Ala Val
    530             535             540

Ile Asn Ile Asp Pro Ser Ala Leu Gln Pro Asn Val Phe Val Trp His
545             550             555                     560

Lys Gly Asp Pro Cys Pro Gln Pro Arg Gln Leu Ser Thr Glu Gly Leu
            565             570             575

Pro Ala Cys Ala Pro Ser Val Val Arg Asp Tyr Phe Glu Gly Ser Gly
        580             585             590

Phe Gly Phe Gly Val Thr Ile Gly Thr Leu Cys Cys Phe Pro Leu Val
        595             600             605

Ser Leu Leu Ser Ala Trp Ile Val Ala Arg Leu Arg Met Arg Asn Phe
    610             615             620

Lys Arg Leu Gln Gly Gln Asp Arg Gln Ser Ile Val Ser Glu Lys Leu
625             630             635             640

Val Gly Gly Met Glu Ala Leu Glu Trp Gln Gly His Lys Glu Pro Cys
            645             650             655

Arg Pro Val Leu Val Tyr Leu Gln Pro Gly Gln Ile Arg Val Val Asp
            660             665             670

Gly Arg Leu Thr Val Leu Arg Thr Ile Gln Leu Gln Pro Pro Gln Lys
            675             680             685

Val Asn Phe Val Leu Ser Ser Asn Arg Gly Arg Arg Thr Leu Leu Leu
    690             695             700

Lys Ile Pro Lys Glu Tyr Asp Leu Val Leu Leu Phe Asn Leu Glu Glu
705             710             715             720

Glu Arg Gln Ala Leu Val Glu Asn Leu Arg Gly Ala Leu Lys Glu Ser
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                725                    730                    735

Gly Leu Ser Ile Gln Glu Trp Glu Leu Arg Glu Gln Glu Leu Met Arg
            740             745             750

Ala Ala Val Thr Arg Glu Gln Arg Arg His Leu Leu Glu Thr Phe Phe
            755             760             765

Arg His Leu Phe Ser Gln Val Leu Asp Ile Asn Gln Ala Asp Ala Gly
        770             775             780

Thr Leu Pro Leu Asp Ser Ser Gln Lys Val Arg Glu Ala Leu Thr Cys
785             790             795             800

Glu Leu Ser Arg Ala Glu Phe Ala Glu Ser Leu Gly Leu Lys Pro Gln
                805             810             815

Asp Met Phe Val Glu Ser Met Phe Ser Leu Ala Asp Lys Asp Gly Asn
            820             825             830

Gly Tyr Leu Ser Phe Arg Glu Phe Leu Asp Ile Leu Val Val Phe Met
        835             840             845

Lys Gly Ser Pro Glu Glu Lys Ser Arg Leu Met Phe Arg Met Tyr Asp
    850             855             860

Phe Asp Gly Asn Gly Leu Ile Ser Lys Asp Glu Phe Ile Arg Met Leu
865             870             875             880

Arg Ser Phe Ile Glu Ile Ser Asn Asn Cys Leu Ser Lys Ala Gln Leu
            885             890             895

Ala Glu Val Val Glu Ser Met Phe Arg Glu Ser Gly Phe Gln Asp Lys
            900             905             910

Glu Glu Leu Thr Trp Glu Asp Phe His Phe Met Leu Arg Asp His Asn
        915             920             925

Ser Glu Leu Arg Phe Thr Gln Leu Cys Val Lys Gly Val Glu Val Pro
    930             935             940
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Glu Val Ile Lys Asp Leu Cys Arg Arg Ala Ser Tyr Ile Ser Gln Asp
945   950   955   960

Met Ile Cys Pro Ser Pro Arg Val Ser Ala Arg Cys Ser Arg Ser Asp
                965   970   975

Ile Glu Thr Glu Leu Thr Pro Gln Arg Leu Gln Cys Pro Met Asp Thr
          980   985   990

Asp Pro Pro Gln Glu Ile Arg Arg Arg Phe Gly Lys Lys Val Thr Ser
          995   1000   1005

Phe Gln Pro Leu Leu Phe Thr Glu Ala His Arg Glu Lys Phe Gln
     1010   1015   1020

Arg Ser Cys Leu His Gln Thr Val Gln Gln Phe Lys Arg Phe Ile
     1025   1030   1035

Glu Asn Tyr Arg Arg His Ile Gly Cys Val Ala Val Phe Tyr Ala
     1040   1045   1050

Ile Ala Gly Gly Leu Phe Leu Glu Arg Ala Tyr Tyr Tyr Ala Phe
     1055   1060   1065

Ala Ala His His Thr Gly Ile Thr Asp Thr Thr Arg Val Gly Ile
     1070   1075   1080

Ile Leu Ser Arg Gly Thr Ala Ala Ser Ile Ser Phe Met Phe Ser
     1085   1090   1095

Tyr Ile Leu Leu Thr Met Cys Arg Asn Leu Ile Thr Phe Leu Arg
     1100   1105   1110

Glu Thr Phe Leu Asn Arg Tyr Val Pro Phe Asp Ala Ala Val Asp
     1115   1120   1125

Phe His Arg Leu Ile Ala Ser Thr Ala Ile Val Leu Thr Val Leu
     1130   1135   1140

His Ser Val Gly His Val Val Asn Val Tyr Leu Phe Ser Ile Ser
     1145   1150   1155

Pro Leu Ser Val Leu Ser Cys Leu Phe Pro Gly Leu Phe His Asp
    1160   1165   1170

Asp Gly Ser Glu Leu Pro Gln Lys Tyr Tyr Trp Trp Phe Phe Gln
    1175   1180   1185

Thr Val Pro Gly Leu Thr Gly Val Val Leu Leu Leu Ile Leu Ala
    1190   1195   1200

Ile Met Tyr Val Phe Ala Ser His His Phe Arg Arg Arg Ser Phe
    1205   1210   1215

Arg Gly Phe Trp Leu Thr His His Leu Tyr Ile Leu Leu Tyr Val
    1220   1225   1230

Leu Leu Ile Ile His Gly Ser Phe Ala Leu Ile Gln Leu Pro Arg
    1235   1240   1245

Phe His Ile Phe Phe Leu Val Pro Ala Ile Ile Tyr Gly Gly Asp
    1250   1255   1260

Lys Leu Val Ser Leu Ser Arg Lys Lys Val Glu Ile Ser Val Val
    1265   1270   1275

Lys Ala Glu Leu Leu Pro Ser Gly Val Thr His Leu Arg Phe Gln
    1280   1285   1290

Arg Pro Gln Gly Phe Glu Tyr Lys Ser Gly Gln Trp Val Arg Ile
    1295   1300   1305

Ala Cys Leu Ala Leu Gly Thr Thr Glu Tyr His Pro Phe Thr Leu
    1310   1315   1320

Thr Ser Ala Pro His Glu Asp Thr Leu Ser Leu His Ile Arg Ala
    1325   1330   1335

Ala Gly Pro Trp Thr Thr Arg Leu Arg Glu Ile Tyr Ser Ala Pro
    1340   1345   1350

Thr Gly Asp Arg Cys Ala Arg Tyr Pro Lys Leu Tyr Leu Asp Gly
    1355   1360   1365

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Pro Phe Gly Glu Gly His Gln Glu Trp His Lys Phe Glu Val Ser
    1370             1375             1380

Val Leu Val Gly Gly Gly Ile Gly Val Thr Pro Phe Ala Ser Ile
    1385             1390             1395

Leu Lys Asp Leu Val Phe Lys Ser Ser Val Ser Cys Gln Val Phe
    1400             1405             1410

Cys Lys Lys Ile Tyr Phe Ile Trp Val Thr Arg Thr Gln Arg Gln
    1415             1420             1425

Phe Glu Trp Leu Ala Asp Ile Ile Arg Glu Val Glu Glu Asn Asp
    1430             1435             1440

His Gln Asp Leu Val Ser Val His Ile Tyr Ile Thr Gln Leu Ala
    1445             1450             1455

Glu Lys Phe Asp Leu Arg Thr Thr Met Leu Tyr Ile Cys Glu Arg
    1460             1465             1470

His Phe Gln Lys Val Leu Asn Arg Ser Leu Phe Thr Gly Leu Arg
    1475             1480             1485

Ser Ile Thr His Phe Gly Arg Pro Pro Phe Glu Pro Phe Phe Asn
    1490             1495             1500

Ser Leu Gln Glu Val His Pro Gln Val Arg Lys Ile Gly Val Phe
    1505             1510             1515

Ser Cys Gly Pro Pro Gly Met Thr Lys Asn Val Glu Lys Ala Cys
    1520             1525             1530

Gln Leu Ile Asn Arg Gln Asp Arg Thr His Phe Ser His His Tyr
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Glu Asn Phe
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gtagagcaca gaagcaaaga ttttaagagg aaagaagaca tctgaaccca acaccaccct     180

aaaccacagg ctgcagggtt ggc atg ctc cgt gca aga cca gag gca ctg atg     233
                           Met Leu Arg Ala Arg Pro Glu Ala Leu Met
                            1               5                   10

ctc ctg gga gct ctt ctg act gga tcc ctg ggt cca tcg ggc agt cag     281
Leu Leu Gly Ala Leu Leu Thr Gly Ser Leu Gly Pro Ser Gly Ser Gln
                15                  20                  25

gac gca ctc tca ctg ccc tgg gaa gtg cag cgc tat gac ggc tgg ttt     329
Asp Ala Leu Ser Leu Pro Trp Glu Val Gln Arg Tyr Asp Gly Trp Phe
            30                  35                  40

aac aac ctg agg cac cac gag cgt ggt gct gtt ggc tgc cgg ttg cag     377
Asn Asn Leu Arg His His Glu Arg Gly Ala Val Gly Cys Arg Leu Gln
            45                  50                  55

cgc cgc gta cca gcc aat tac gcc gac ggt gtg tat cag gct ctg gag     425
Arg Arg Val Pro Ala Asn Tyr Ala Asp Gly Val Tyr Gln Ala Leu Glu
        60                  65                  70

gag ccg cag ctg ccc aac ccg cgc cgg ctc agc aac gca gcc acg cgg     473
Glu Pro Gln Leu Pro Asn Pro Arg Arg Leu Ser Asn Ala Ala Thr Arg
75                  80                  85                  90

ggc ata gcc ggc ctg ccg tcg ctc cac aac cgc acc gta ctg ggg gtc     521
Gly Ile Ala Gly Leu Pro Ser Leu His Asn Arg Thr Val Leu Gly Val
                95                  100                 105

ttc ttt ggc tac cat gtt ctt tcc gac gtg gtg agc gtg gaa acg ccc     569
Phe Phe Gly Tyr His Val Leu Ser Asp Val Val Ser Val Glu Thr Pro
                110                 115                 120

ggt tgc ccc gcc gag ttc ctc aac atc cgc atc cca cct gga gac ccc     617
Gly Cys Pro Ala Glu Phe Leu Asn Ile Arg Ile Pro Pro Gly Asp Pro
                125                 130                 135

gtg ttc gac ccc gac cag cgc ggg gac gtg gtg ctg ccc ttc cag agg     665
Val Phe Asp Pro Asp Gln Arg Gly Asp Val Val Leu Pro Phe Gln Arg
    140                 145                 150
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agc cgc tgg gac ccc gag acc gga cgg agt ccc agc aac ccc cgg gac      713
Ser Arg Trp Asp Pro Glu Thr Gly Arg Ser Pro Ser Asn Pro Arg Asp
155             160             165             170

ctg gcc aac cag gtg acg ggc tgg ctg gac ggc agc gcc atc tat ggc      761
Leu Ala Asn Gln Val Thr Gly Trp Leu Asp Gly Ser Ala Ile Tyr Gly
            175             180             185

tcc tcg cac tcc tgg agc gac gcg ctg cgg agc ttc tcg ggg gga cag      809
Ser Ser His Ser Trp Ser Asp Ala Leu Arg Ser Phe Ser Gly Gly Gln
        190             195             200

ctg gcg tcg ggg ccc gac ccc gct ttc ccc cga gac tcg cag aac ccc      857
Leu Ala Ser Gly Pro Asp Pro Ala Phe Pro Arg Asp Ser Gln Asn Pro
        205             210             215

ctg ctc atg tgg gcg gcg ccc gac ccc gcc acc ggg cag aac ggg ccc      905
Leu Leu Met Trp Ala Ala Pro Asp Pro Ala Thr Gly Gln Asn Gly Pro
        220             225             230

cgg ggg ctg tac gcc ttc ggg gca gag aga ggg aac cgg gaa ccc ttc      953
Arg Gly Leu Tyr Ala Phe Gly Ala Glu Arg Gly Asn Arg Glu Pro Phe
235             240             245             250

ctg cag gcg ctg ggc ctg ctc tgg ttc cgc tac cac aac ctg tgg gcg     1001
Leu Gln Ala Leu Gly Leu Leu Trp Phe Arg Tyr His Asn Leu Trp Ala
            255             260             265

cag agg ctg gcc cgc cag cac cca gac tgg gag gac gag gag ctg ttc     1049
Gln Arg Leu Ala Arg Gln His Pro Asp Trp Glu Asp Glu Glu Leu Phe
            270             275             280

cag cac gca cgc aag agg gtc atc gcc acc tac cag aac atc gct gtg     1097
Gln His Ala Arg Lys Arg Val Ile Ala Thr Tyr Gln Asn Ile Ala Val
            285             290             295

tat gag tgg ctg ccc agc ttc ctg cag aaa aca ctc ccg gag tat aca     1145
Tyr Glu Trp Leu Pro Ser Phe Leu Gln Lys Thr Leu Pro Glu Tyr Thr
    300             305             310

gga tac cgt cct ttc cta gac ccc agc atc tcc ccg gaa ttt gtg gtg     1193
Gly Tyr Arg Pro Phe Leu Asp Pro Ser Ile Ser Pro Glu Phe Val Val
315             320             325             330

gcc tct gag cag ttc ttc tct acc atg gtg ccc cct ggt gtc tac atg     1241
Ala Ser Glu Gln Phe Phe Ser Thr Met Val Pro Pro Gly Val Tyr Met
            335             340             345

aga aat gcc agc tgt cat ttc cgg aag gtc ctg aac aag ggt ttt caa     1289
Arg Asn Ala Ser Cys His Phe Arg Lys Val Leu Asn Lys Gly Phe Gln
            350             355             360

agc tcc caa gct ctc agg gtc tgc aac aac tac tgg att cgg gag aac     1337
Ser Ser Gln Ala Leu Arg Val Cys Asn Asn Tyr Trp Ile Arg Glu Asn
```

```
                365                    370                      375
ccc aat ctg aac agt acc cag gag gtg aat gag ctg ctg ctg gga atg    1385
Pro Asn Leu Asn Ser Thr Gln Glu Val Asn Glu Leu Leu Leu Gly Met
    380                385                  390

gcc tcc cag att tcg gag ttg gag gac aac ata gtg gtt gaa gat ctg    1433
Ala Ser Gln Ile Ser Glu Leu Glu Asp Asn Ile Val Val Glu Asp Leu
395             400                  405                      410

agg gat tac tgg cct ggc cct ggc aaa ttc tcc cgt aca gac tat gtg    1481
Arg Asp Tyr Trp Pro Gly Pro Gly Lys Phe Ser Arg Thr Asp Tyr Val
                415                  420                  425

gcc agc agc atc caa cgt ggc cga gat atg ggg ctg ccc agc tat agc    1529
Ala Ser Ser Ile Gln Arg Gly Arg Asp Met Gly Leu Pro Ser Tyr Ser
                430                  435                  440

cag gcc ctg ctg gcc ttt ggg ctg gac atc cca agg aac tgg agt gat    1577
Gln Ala Leu Leu Ala Phe Gly Leu Asp Ile Pro Arg Asn Trp Ser Asp
            445                  450                  455

ctc aac cct aat gtg gac ccc cag gtg ctg gag gcc aca gct gcc ctg    1625
Leu Asn Pro Asn Val Asp Pro Gln Val Leu Glu Ala Thr Ala Ala Leu
        460                  465                  470

tac aac cag gac cta tcc cag cta gag ctg ctc ctt ggg ggg ctc ctg    1673
Tyr Asn Gln Asp Leu Ser Gln Leu Glu Leu Leu Leu Gly Gly Leu Leu
475                  480                  485                  490

gag agc cat ggg gac cct gga ccc ctg ttc agt gcc att gtc ctc gac    1721
Glu Ser His Gly Asp Pro Gly Pro Leu Phe Ser Ala Ile Val Leu Asp
                495                  500                  505

cag ttt gta cgg ctg cgg gat ggt gac cgc tac tgg ttt gag aac acc    1769
Gln Phe Val Arg Leu Arg Asp Gly Asp Arg Tyr Trp Phe Glu Asn Thr
            510                  515                  520

agg aat ggg ctg ttc tcc aag aag gag att gaa gac atc cga aat acc    1817
Arg Asn Gly Leu Phe Ser Lys Lys Glu Ile Glu Asp Ile Arg Asn Thr
            525                  530                  535

acc ctg cgg gac gtg ctg gtc gct gtt atc aac att gac ccc agt gcc    1865
Thr Leu Arg Asp Val Leu Val Ala Val Ile Asn Ile Asp Pro Ser Ala
            540                  545                  550

ctg cag ccc aat gtc ttt gtc tgg cat aaa ggt gca ccc tgc cct caa    1913
Leu Gln Pro Asn Val Phe Val Trp His Lys Gly Ala Pro Cys Pro Gln
555                  560                  565                  570

cct aag cag ctc aca act gac ggc ctg ccc cag tgt gca ccc ctg act    1961
Pro Lys Gln Leu Thr Thr Asp Gly Leu Pro Gln Cys Ala Pro Leu Thr
            575                  580                  585

gtg ctt gac ttc ttt gaa ggc agc agc cct ggt ttt gcc atc acc atc    2009
```

```
            Val Leu Asp Phe Phe Glu Gly Ser Ser Pro Gly Phe Ala Ile Thr Ile
                        590             595             600


att gct ctc tgc tgc ctt ccc tta gtg agt ctg ctt ctc tct gga gtg          2057
Ile Ala Leu Cys Cys Leu Pro Leu Val Ser Leu Leu Leu Ser Gly Val
            605             610             615


gtg gcc tat ttc cgg ggc cga gaa cac aag aag cta caa aag aaa ctc          2105
Val Ala Tyr Phe Arg Gly Arg Glu His Lys Lys Leu Gln Lys Lys Leu
            620             625             630


aaa gag agc gtg aag aag gaa gca gcc aaa gat gga gtg cca gcg atg          2153
Lys Glu Ser Val Lys Lys Glu Ala Ala Lys Asp Gly Val Pro Ala Met
635             640             645             650


gag tgg cca ggc ccc aag gag agg agc agt ccc atc atc atc cag ctg          2201
Glu Trp Pro Gly Pro Lys Glu Arg Ser Ser Pro Ile Ile Ile Gln Leu
                655             660             665


ctg tca gac agg tgt ctg cag gtc ctg aac agg cat ctc act gtg ctc          2249
Leu Ser Asp Arg Cys Leu Gln Val Leu Asn Arg His Leu Thr Val Leu
                670             675             680


cgt gtg gtc cag ctg cag cct ctg cag cag gtc aac ctc atc ctg tcc          2297
Arg Val Val Gln Leu Gln Pro Leu Gln Gln Val Asn Leu Ile Leu Ser
            685             690             695


aac aac cga gga tgc cgc acc ctg ctg ctc aag atc cct aag gag tat          2345
Asn Asn Arg Gly Cys Arg Thr Leu Leu Leu Lys Ile Pro Lys Glu Tyr
            700             705             710


gac ctg gtg ctg ctg ttt agt tct gaa gag gaa cgg ggc gcc ttt gtg          2393
Asp Leu Val Leu Leu Phe Ser Ser Glu Glu Glu Arg Gly Ala Phe Val
715             720             725             730


cag cag cta tgg gac ttc tgc gtg cgc tgg gct ctg ggc ctc cat gtg          2441
Gln Gln Leu Trp Asp Phe Cys Val Arg Trp Ala Leu Gly Leu His Val
                735             740             745


gct gag atg agc gag aag gag cta ttt agg aag gct gtg aca aag cag          2489
Ala Glu Met Ser Glu Lys Glu Leu Phe Arg Lys Ala Val Thr Lys Gln
                750             755             760


cag cgg gaa cgc atc ctg gag atc ttc ttc aga cac ctt ttt gct cag          2537
Gln Arg Glu Arg Ile Leu Glu Ile Phe Phe Arg His Leu Phe Ala Gln
            765             770             775


gtg ctg gac atc aac cag gcc gac gca ggg acc ctg ccc ctg gac tcc          2585
Val Leu Asp Ile Asn Gln Ala Asp Ala Gly Thr Leu Pro Leu Asp Ser
            780             785             790


tcc cag aag gtg cgg gag gcc ctg acc tgc gag ctg agc agg gcc gag          2633
Ser Gln Lys Val Arg Glu Ala Leu Thr Cys Glu Leu Ser Arg Ala Glu
795             800             805             810
```

```
ttt gcc gag tcc ctg ggc ctc aag ccc cag gac atg ttt gtg gag tcc        2681
Phe Ala Glu Ser Leu Gly Leu Lys Pro Gln Asp Met Phe Val Glu Ser
                    815             820                 825

atg ttc tct ctg gct gac aag gat ggc aat ggc tac ctg tcc ttc cga        2729
Met Phe Ser Leu Ala Asp Lys Asp Gly Asn Gly Tyr Leu Ser Phe Arg
                    830             835                 840

gag ttc ctg gac atc ctg gtg gtc ttc atg aaa ggc tcc cca gag gat        2777
Glu Phe Leu Asp Ile Leu Val Val Phe Met Lys Gly Ser Pro Glu Asp
                    845             850                 855

aag tcc cgt cta atg ttt acc atg tat gac ctg gat gag aat ggc ttc        2825
Lys Ser Arg Leu Met Phe Thr Met Tyr Asp Leu Asp Glu Asn Gly Phe
                    860             865                 870

ctc tcc aag gac gaa ttc ttc acc atg atg cga tcc ttc atc gag atc        2873
Leu Ser Lys Asp Glu Phe Phe Thr Met Met Arg Ser Phe Ile Glu Ile
875                 880                 885                 890

tcc aac aac tgc ctg tcc aag gcc cag ctg gcc gag gtg gtg gag tct        2921
Ser Asn Asn Cys Leu Ser Lys Ala Gln Leu Ala Glu Val Val Glu Ser
                    895             900                 905

atg ttc cgg gag tcg gga ttc cag gac aag gag gag ctg aca tgg gag        2969
Met Phe Arg Glu Ser Gly Phe Gln Asp Lys Glu Glu Leu Thr Trp Glu
                    910             915                 920

gat ttt cac ttc atg ctg cgg gac cat gac agc gag ctc cgc ttc acg        3017
Asp Phe His Phe Met Leu Arg Asp His Asp Ser Glu Leu Arg Phe Thr
                    925             930                 935

cag ctc tgt gtc aaa ggt gga ggt gga ggt gga aat ggt att aga gat        3065
Gln Leu Cys Val Lys Gly Gly Gly Gly Gly Gly Asn Gly Ile Arg Asp
                    940             945                 950

atc ttt aaa caa aac atc agc tgt cga gtc tcg ttc atc act cgg aca        3113
Ile Phe Lys Gln Asn Ile Ser Cys Arg Val Ser Phe Ile Thr Arg Thr
955                 960                 965                 970

cct ggg gag cgc tcc cac ccc cag gga ctg ggg ccc cct gcc cca gaa        3161
Pro Gly Glu Arg Ser His Pro Gln Gly Leu Gly Pro Pro Ala Pro Glu
                    975             980                 985

gcc cca gag ctg gga ggc cct gga ctg aag aag agg ttt ggc  aaa aag       3209
Ala Pro Glu Leu Gly Gly Pro Gly Leu Lys Lys Arg Phe Gly  Lys Lys
                    990             995             1000

gca gca gtg  ccc act ccc cgg ctg  tac aca gag gcg ctg  caa gag         3254
Ala Ala Val  Pro Thr Pro Arg Leu  Tyr Thr Glu Ala Leu  Gln Glu
            1005             1010                 1015

aag atg cag  cga ggc ttc cta gcc  caa aag ctg cag cag  tac aag         3299
Lys Met Gln  Arg Gly Phe Leu Ala  Gln Lys Leu Gln Gln  Tyr Lys
            1020             1025                 1030
```

```
cgc ttc gtg   gag aac tac cgg agg   cac atc gtg tgt gtg   gca atc      3344
Arg Phe Val   Glu Asn Tyr Arg Arg   His Ile Val Cys Val   Ala Ile
        1035              1040                 1045

ttc tcg gcc   atc tgt gtt ggc gtg   ttt gca gat cgt gct   tac tac      3389
Phe Ser Ala   Ile Cys Val Gly Val   Phe Ala Asp Arg Ala   Tyr Tyr
        1050              1055                 1060

tat ggc ttt   gcc tcg cca ccc tcg   gac att gca cag acc   acc ctc      3434
Tyr Gly Phe   Ala Ser Pro Pro Ser   Asp Ile Ala Gln Thr   Thr Leu
        1065              1070                 1075

gtg ggc atc   atc ctg tca cga ggc   acg gcg gcc agc gtc   tcc ttc      3479
Val Gly Ile   Ile Leu Ser Arg Gly   Thr Ala Ala Ser Val   Ser Phe
        1080              1085                 1090

atg ttc tct   tat atc ttg ctc acc   atg tgc cgc aac ctc   ata acc      3524
Met Phe Ser   Tyr Ile Leu Leu Thr   Met Cys Arg Asn Leu   Ile Thr
        1095              1100                 1105

ttc ctg cga   gag act ttc ctc aac   cgc tat gtg cct ttt   gat gcc      3569
Phe Leu Arg   Glu Thr Phe Leu Asn   Arg Tyr Val Pro Phe   Asp Ala
        1110              1115                 1120

gca gtg gac   ttc cac cgc tgg atc   gcc atg gct gct gtt   gtc ctg      3614
Ala Val Asp   Phe His Arg Trp Ile   Ala Met Ala Ala Val   Val Leu
        1125              1130                 1135

gcc att ttg   cac agt gct ggc cac   gca gtc aat gtc tac   atc ttc      3659
Ala Ile Leu   His Ser Ala Gly His   Ala Val Asn Val Tyr   Ile Phe
        1140              1145                 1150

tca gtc agc   cca ctc agc ctg ctg   gcc tgc ata ttc ccc   aac gtc      3704
Ser Val Ser   Pro Leu Ser Leu Leu   Ala Cys Ile Phe Pro   Asn Val
        1155              1160                 1165

ttt gtg aat   gat ggg tcc aag ctt   ccc cag aag ttc tat   tgg tgg      3749
Phe Val Asn   Asp Gly Ser Lys Leu   Pro Gln Lys Phe Tyr   Trp Trp
        1170              1175                 1180

ttc ttc cag   acc gtc cca ggt atg   aca ggt gtg ctt ctg   ctc ctg      3794
Phe Phe Gln   Thr Val Pro Gly Met   Thr Gly Val Leu Leu   Leu Leu
        1185              1190                 1195

gtc ctg gcc   atc atg tat gtc ttc   gcc tcc cac cac ttc   cgc cgc      3839
Val Leu Ala   Ile Met Tyr Val Phe   Ala Ser His His Phe   Arg Arg
        1200              1205                 1210

cgc agc ttc   cgg ggc ttc tgg ctg   acc cac cac ctc tac   atc ctg      3884
Arg Ser Phe   Arg Gly Phe Trp Leu   Thr His His Leu Tyr   Ile Leu
        1215              1220                 1225

ctc tat gcc   ctg ctc atc atc cat   ggc agc tat gct ctg   atc cag      3929
Leu Tyr Ala   Leu Leu Ile Ile His   Gly Ser Tyr Ala Leu   Ile Gln
```

```
                1230                    1235                    1240

ctg ccc act  ttc cac atc tac ttc  ctg gtc ccg gca atc  atc tat       3974
Leu Pro Thr  Phe His Ile Tyr Phe  Leu Val Pro Ala Ile  Ile Tyr
        1245                1250                1255

gga ggt gac  aag ctg gtg agc ctg  agc cgg aag aag gtg  gag atc       4019
Gly Gly Asp  Lys Leu Val Ser Leu  Ser Arg Lys Lys Val  Glu Ile
        1260                1265                1270

agc gtg gtg  aag gcg gag ctg ctg  ccc tca gga gtg acc  tac ctg       4064
Ser Val Val  Lys Ala Glu Leu Leu  Pro Ser Gly Val Thr  Tyr Leu
        1275                1280                1285

caa ttc cag  agg ccc caa ggc ttt  gag tac aag tca gga  cag tgg       4109
Gln Phe Gln  Arg Pro Gln Gly Phe  Glu Tyr Lys Ser Gly  Gln Trp
        1290                1295                1300

gtg cgg atc  gcc tgc ctg gct ctg  ggg acc acc gag tac  cac ccc       4154
Val Arg Ile  Ala Cys Leu Ala Leu  Gly Thr Thr Glu Tyr  His Pro
        1305                1310                1315

ttc aca ctg  acc tcc gcg ccc cat  gag gac aca ctc agc  ctg cac       4199
Phe Thr Leu  Thr Ser Ala Pro His  Glu Asp Thr Leu Ser  Leu His
        1320                1325                1330

atc cgg gca  gtg ggg ccc tgg acc  act cgc ctc agg gag  atc tac       4244
Ile Arg Ala  Val Gly Pro Trp Thr  Thr Arg Leu Arg Glu  Ile Tyr
        1335                1340                1345

tca tcc cca  aag ggc aat ggc tgt  gct gga tac cca aag  ctg tac       4289
Ser Ser Pro  Lys Gly Asn Gly Cys  Ala Gly Tyr Pro Lys  Leu Tyr
        1350                1355                1360

ctt gat gga  ccg ttt gga gag ggc  cat cag gag tgg cat  aaa ttt       4334
Leu Asp Gly  Pro Phe Gly Glu Gly  His Gln Glu Trp His  Lys Phe
        1365                1370                1375

gag gtg tca  gtg ttg gtg gga ggg  ggc att ggg gtc acc  ccc ttt       4379
Glu Val Ser  Val Leu Val Gly Gly  Gly Ile Gly Val Thr  Pro Phe
        1380                1385                1390

gcc tcc atc  ctc aaa gac ctg gtc  ttc aag tca tcc ttg  ggc agc       4424
Ala Ser Ile  Leu Lys Asp Leu Val  Phe Lys Ser Ser Leu  Gly Ser
        1395                1400                1405

caa atg ctg  tgt aag aag atc tac  ttc atc tgg gtg aca  cgg acc       4469
Gln Met Leu  Cys Lys Lys Ile Tyr  Phe Ile Trp Val Thr  Arg Thr
        1410                1415                1420

cag cgt cag  ttt gag tgg ctg gct  gac atc atc caa gag  gtg gag       4514
Gln Arg Gln  Phe Glu Trp Leu Ala  Asp Ile Ile Gln Glu  Val Glu
        1425                1430                1435

gag aac gac  cac cag gac ctg gtg  tct gtg cac att tat  gtc acc       4559
```

```
Glu Asn Asp  His Gln Asp Leu Val  Ser Val His Ile Tyr  Val Thr
         1440              1445             1450
```

```
cag ctg gct  gag aag ttc gac ctc  agg acc acc atg cta  tac atc    4604
Gln Leu Ala  Glu Lys Phe Asp Leu  Arg Thr Thr Met Leu  Tyr Ile
         1455              1460             1465
```

```
tgc gag cgg  cac ttc cag aaa gtg  ctg aac cgg agt ctg  ttc acg    4649
Cys Glu Arg  His Phe Gln Lys Val  Leu Asn Arg Ser Leu  Phe Thr
         1470              1475             1480
```

```
ggc ctg cgc  tcc atc acc cac ttt  ggc cgt ccc ccc ttc  gag ccc    4694
Gly Leu Arg  Ser Ile Thr His Phe  Gly Arg Pro Pro Phe  Glu Pro
         1485              1490             1495
```

```
ttc ttc aac  tcc ctg cag gag gtc  cac cca cag gtg cgc  aag atc    4739
Phe Phe Asn  Ser Leu Gln Glu Val  His Pro Gln Val Arg  Lys Ile
         1500              1505             1510
```

```
ggg gtg ttc  agc tgc ggc cct cca  gga atg acc aag aat  gta gag    4784
Gly Val Phe  Ser Cys Gly Pro Pro  Gly Met Thr Lys Asn  Val Glu
         1515              1520             1525
```

```
aag gcc tgt  cag ctc gtc aac agg  cag gac cga gcc cac  ttc atg    4829
Lys Ala Cys  Gln Leu Val Asn Arg  Gln Asp Arg Ala His  Phe Met
         1530              1535             1540
```

```
cac cac tat  gag aac ttc tga gcctgtcctc cctggctgct gcttccagta     4880
His His Tyr  Glu Asn Phe
         1545
```

```
tcctgccttc tcttctgtgc acctaagttg cccagccctg ctggcaatct ctccatcaga    4940

atccacctta ggcctcagct ggagggctgc agagccctc ccaatattgg gagaatattg     5000

acccagacaa ttatacaaat gagaaaaggc aggagactat gttctacaat tgcagtgcat    5060

gatgattata agtccacctg tttatcaacg gcaccattcc tgcagccctc cagacttcct    5120

gcccttagca agtgcgcaac cagtcaggat ctcccaaaga agataaagac cactcctcac    5180

cccagctcaa gccatggcag gcgtggcaag caaagtgggg aggagacagt ccctgcttgt    5240

gacaagtgtg gaggtgaaaa ggtacaatag tgcttgtctc cgatagctcc ccacatctct    5300

aattgacttc cacaaaatcg atgcgttgct ttggtatttg cttggactga catttgaggg    5360

aggaggaggc tgggatcctc tggctgagaa tctcctcaga gcccagtgca gaagctgtga    5420

tgcttagaac ctggacagcc cgactgcctc aactctgtct ccaggtctat tccctccagc    5480

tccaaaagga gcagccctac ttctacccct tcccgtcccc aaagtgtcag caactttgag    5540

gagggcacca ggaaacaaag atgcctcccc agccctgata ttcttgatgt caccagtgat    5600
```

```
acccactgcc ctgacccctg ggcaggcccc tctctgcatc tactggagtg gtccctgggc   5660

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tcttccacaa gagttgggtg accagctgtc ctagtttgcc caggactctc cctgttttag   5780

cactgaaagt ctcttgcccc aggaaacccc atcagtccca ggcagattgg gacagctggt   5840

caccttacgc aagagccagg ctgaaacatc ccctccatac tcagctcttt aacttttctt   5900

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<210> 14
<211> 1548
<212> PRT
<213> Homo sapiens

<400> 14

```
Met Leu Arg Ala Arg Pro Glu Ala Leu Met Leu Leu Gly Ala Leu Leu
1               5                   10                  15


Thr Gly Ser Leu Gly Pro Ser Gly Ser Gln Asp Ala Leu Ser Leu Pro
            20                  25                  30


Trp Glu Val Gln Arg Tyr Asp Gly Trp Phe Asn Asn Leu Arg His His
            35                  40                  45


Glu Arg Gly Ala Val Gly Cys Arg Leu Gln Arg Arg Val Pro Ala Asn
    50                  55                  60


Tyr Ala Asp Gly Val Tyr Gln Ala Leu Glu Glu Pro Gln Leu Pro Asn
65                  70                  75                  80


Pro Arg Arg Leu Ser Asn Ala Ala Thr Arg Gly Ile Ala Gly Leu Pro
```

                    85   90   95

Ser Leu His Asn Arg Thr Val Leu Gly Val Phe Phe Gly Tyr His Val
            100   105   110

Leu Ser Asp Val Val Ser Val Glu Thr Pro Gly Cys Pro Ala Glu Phe
            115   120   125

Leu Asn Ile Arg Ile Pro Pro Gly Asp Pro Val Phe Asp Pro Asp Gln
    130   135   140

Arg Gly Asp Val Val Leu Pro Phe Gln Arg Ser Arg Trp Asp Pro Glu
145   150   155   160

Thr Gly Arg Ser Pro Ser Asn Pro Arg Asp Leu Ala Asn Gln Val Thr
                165   170   175

Gly Trp Leu Asp Gly Ser Ala Ile Tyr Gly Ser Ser His Ser Trp Ser
            180   185   190

Asp Ala Leu Arg Ser Phe Ser Gly Gly Gln Leu Ala Ser Gly Pro Asp
            195   200   205

Pro Ala Phe Pro Arg Asp Ser Gln Asn Pro Leu Leu Met Trp Ala Ala
    210   215   220

Pro Asp Pro Ala Thr Gly Gln Asn Gly Pro Arg Gly Leu Tyr Ala Phe
225   230   235   240

Gly Ala Glu Arg Gly Asn Arg Glu Pro Phe Leu Gln Ala Leu Gly Leu
                245   250   255

Leu Trp Phe Arg Tyr His Asn Leu Trp Ala Gln Arg Leu Ala Arg Gln
            260   265   270

His Pro Asp Trp Glu Asp Glu Glu Leu Phe Gln His Ala Arg Lys Arg
            275   280   285

Val Ile Ala Thr Tyr Gln Asn Ile Ala Val Tyr Glu Trp Leu Pro Ser
    290   295   300

Phe Leu Gln Lys Thr Leu Pro Glu Tyr Thr Gly Tyr Arg Pro Phe Leu
305   310   315   320

Asp Pro Ser Ile Ser Pro Glu Phe Val Val Ala Ser Glu Gln Phe Phe
                325   330   335

Ser Thr Met Val Pro Pro Gly Val Tyr Met Arg Asn Ala Ser Cys His
            340   345   350

Phe Arg Lys Val Leu Asn Lys Gly Phe Gln Ser Ser Gln Ala Leu Arg
        355   360   365

Val Cys Asn Asn Tyr Trp Ile Arg Glu Asn Pro Asn Leu Asn Ser Thr
    370   375   380

Gln Glu Val Asn Glu Leu Leu Leu Gly Met Ala Ser Gln Ile Ser Glu
385   390   395   400

Leu Glu Asp Asn Ile Val Val Glu Asp Leu Arg Asp Tyr Trp Pro Gly
            405   410   415

Pro Gly Lys Phe Ser Arg Thr Asp Tyr Val Ala Ser Ser Ile Gln Arg
        420   425   430

Gly Arg Asp Met Gly Leu Pro Ser Tyr Ser Gln Ala Leu Leu Ala Phe
        435   440   445

Gly Leu Asp Ile Pro Arg Asn Trp Ser Asp Leu Asn Pro Asn Val Asp
    450   455   460

Pro Gln Val Leu Glu Ala Thr Ala Ala Leu Tyr Asn Gln Asp Leu Ser
465   470   475   480

Gln Leu Glu Leu Leu Leu Gly Gly Leu Leu Glu Ser His Gly Asp Pro
            485   490   495

Gly Pro Leu Phe Ser Ala Ile Val Leu Asp Gln Phe Val Arg Leu Arg
        500   505   510

Asp Gly Asp Arg Tyr Trp Phe Glu Asn Thr Arg Asn Gly Leu Phe Ser
    515   520   525

Lys Lys Glu Ile Glu Asp Ile Arg Asn Thr Thr Leu Arg Asp Val Leu
    530   535   540

Val Ala Val Ile Asn Ile Asp Pro Ser Ala Leu Gln Pro Asn Val Phe
545   550   555   560

Val Trp His Lys Gly Ala Pro Cys Pro Gln Pro Lys Gln Leu Thr Thr
            565   570   575

Asp Gly Leu Pro Gln Cys Ala Pro Leu Thr Val Leu Asp Phe Phe Glu
            580   585   590

Gly Ser Ser Pro Gly Phe Ala Ile Thr Ile Ile Ala Leu Cys Cys Leu
        595   600   605

Pro Leu Val Ser Leu Leu Leu Ser Gly Val Val Ala Tyr Phe Arg Gly
    610   615   620

Arg Glu His Lys Lys Leu Gln Lys Lys Leu Lys Glu Ser Val Lys Lys
625   630   635   640

Glu Ala Ala Lys Asp Gly Val Pro Ala Met Glu Trp Pro Gly Pro Lys
            645   650   655

Glu Arg Ser Ser Pro Ile Ile Ile Gln Leu Leu Ser Asp Arg Cys Leu
            660   665   670

Gln Val Leu Asn Arg His Leu Thr Val Leu Arg Val Val Gln Leu Gln
        675   680   685

Pro Leu Gln Gln Val Asn Leu Ile Leu Ser Asn Asn Arg Gly Cys Arg
    690   695   700

Thr Leu Leu Leu Lys Ile Pro Lys Glu Tyr Asp Leu Val Leu Leu Phe
705   710   715   720

Ser Ser Glu Glu Glu Arg Gly Ala Phe Val Gln Gln Leu Trp Asp Phe
            725   730   735

Cys Val Arg Trp Ala Leu Gly Leu His Val Ala Glu Met Ser Glu Lys
            740   745   750

Glu Leu Phe Arg Lys Ala Val Thr Lys Gln Gln Arg Glu Arg Ile Leu
    755   760   765

Glu Ile Phe Phe Arg His Leu Phe Ala Gln Val Leu Asp Ile Asn Gln
    770   775   780

Ala Asp Ala Gly Thr Leu Pro Leu Asp Ser Ser Gln Lys Val Arg Glu
785   790   795   800

Ala Leu Thr Cys Glu Leu Ser Arg Ala Glu Phe Ala Glu Ser Leu Gly
         805   810   815

Leu Lys Pro Gln Asp Met Phe Val Glu Ser Met Phe Ser Leu Ala Asp
         820   825   830

Lys Asp Gly Asn Gly Tyr Leu Ser Phe Arg Glu Phe Leu Asp Ile Leu
       835   840   845

Val Val Phe Met Lys Gly Ser Pro Glu Asp Lys Ser Arg Leu Met Phe
    850   855   860

Thr Met Tyr Asp Leu Asp Glu Asn Gly Phe Leu Ser Lys Asp Glu Phe
865   870   875   880

Phe Thr Met Met Arg Ser Phe Ile Glu Ile Ser Asn Asn Cys Leu Ser
         885   890   895

Lys Ala Gln Leu Ala Glu Val Val Glu Ser Met Phe Arg Glu Ser Gly
         900   905   910

Phe Gln Asp Lys Glu Glu Leu Thr Trp Glu Asp Phe His Phe Met Leu
       915   920   925

Arg Asp His Asp Ser Glu Leu Arg Phe Thr Gln Leu Cys Val Lys Gly
       930   935   940

Gly Gly Gly Gly Gly Asn Gly Ile Arg Asp Ile Phe Lys Gln Asn Ile
945   950   955   960

Ser Cys Arg Val Ser Phe Ile Thr Arg Thr Pro Gly Glu Arg Ser His

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            965                    970                    975

Pro Gln Gly Leu Gly Pro Pro Ala Pro Glu Ala Pro Glu Leu Gly Gly
            980                985                990

Pro Gly Leu Lys Lys Arg Phe Gly  Lys Lys Ala Ala Val  Pro Thr Pro
            995               1000               1005

Arg Leu  Tyr Thr Glu Ala Leu  Gln Glu Lys Met Gln  Arg Gly Phe
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Leu Ala  Gln Lys Leu Gln Gln  Tyr Lys Arg Phe Val  Glu Asn Tyr
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Arg Arg  His Ile Val Cys Val  Ala Ile Phe Ser Ala  Ile Cys Val
     1040              1045              1050

Gly Val  Phe Ala Asp Arg Ala  Tyr Tyr Tyr Gly Phe  Ala Ser Pro
     1055              1060              1065

Pro Ser  Asp Ile Ala Gln Thr  Thr Leu Val Gly Ile  Ile Leu Ser
     1070              1075              1080

Arg Gly  Thr Ala Ala Ser Val  Ser Phe Met Phe Ser  Tyr Ile Leu
     1085              1090              1095

Leu Thr  Met Cys Arg Asn Leu  Ile Thr Phe Leu Arg  Glu Thr Phe
     1100              1105              1110

Leu Asn  Arg Tyr Val Pro Phe  Asp Ala Ala Val Asp  Phe His Arg
     1115              1120              1125

Trp Ile  Ala Met Ala Ala Val  Val Leu Ala Ile Leu  His Ser Ala
     1130              1135              1140

Gly His  Ala Val Asn Val Tyr  Ile Phe Ser Val Ser  Pro Leu Ser
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Leu Leu  Ala Cys Ile Phe Pro  Asn Val Phe Val Asn  Asp Gly Ser
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Lys Leu Pro Gln Lys Phe Tyr Trp Trp Phe Phe Gln Thr Val Pro
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Gly Met Thr Gly Val Leu Leu Leu Leu Val Leu Ala Ile Met Tyr
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Val Phe Ala Ser His His Phe Arg Arg Arg Ser Phe Arg Gly Phe
    1205   1210   1215

Trp Leu Thr His His Leu Tyr Ile Leu Leu Tyr Ala Leu Leu Ile
    1220   1225   1230

Ile His Gly Ser Tyr Ala Leu Ile Gln Leu Pro Thr Phe His Ile
    1235   1240   1245

Tyr Phe Leu Val Pro Ala Ile Ile Tyr Gly Gly Asp Lys Leu Val
    1250   1255   1260

Ser Leu Ser Arg Lys Lys Val Glu Ile Ser Val Val Lys Ala Glu
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Leu Leu Pro Ser Gly Val Thr Tyr Leu Gln Phe Gln Arg Pro Gln
    1280   1285   1290

Gly Phe Glu Tyr Lys Ser Gly Gln Trp Val Arg Ile Ala Cys Leu
    1295   1300   1305

Ala Leu Gly Thr Thr Glu Tyr His Pro Phe Thr Leu Thr Ser Ala
    1310   1315   1320

Pro His Glu Asp Thr Leu Ser Leu His Ile Arg Ala Val Gly Pro
    1325   1330   1335

Trp Thr Thr Arg Leu Arg Glu Ile Tyr Ser Ser Pro Lys Gly Asn
    1340   1345   1350

Gly Cys Ala Gly Tyr Pro Lys Leu Tyr Leu Asp Gly Pro Phe Gly
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Glu Gly His Gln Glu Trp His Lys Phe Glu Val Ser Val Leu Val
    1370   1375   1380

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Gly Gly  Gly Ile Gly Val Thr  Pro Phe Ala Ser Ile  Leu Lys Asp
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Leu Val  Phe Lys Ser Ser Leu  Gly Ser Gln Met Leu  Cys Lys Lys
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Ile Tyr  Phe Ile Trp Val Thr  Arg Thr Gln Arg Gln  Phe Glu Trp
    1415              1420              1425

Leu Ala  Asp Ile Ile Gln Glu  Val Glu Glu Asn Asp  His Gln Asp
    1430              1435              1440

Leu Val  Ser Val His Ile Tyr  Val Thr Gln Leu Ala  Glu Lys Phe
    1445              1450              1455

Asp Leu  Arg Thr Thr Met Leu  Tyr Ile Cys Glu Arg  His Phe Gln
    1460              1465              1470

Lys Val  Leu Asn Arg Ser Leu  Phe Thr Gly Leu Arg  Ser Ile Thr
    1475              1480              1485

His Phe  Gly Arg Pro Pro Phe  Glu Pro Phe Phe Asn  Ser Leu Gln
    1490              1495              1500

Glu Val  His Pro Gln Val Arg  Lys Ile Gly Val Phe  Ser Cys Gly
    1505              1510              1515

Pro Pro  Gly Met Thr Lys Asn  Val Glu Lys Ala Cys  Gln Leu Val
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Asn Arg  Gln Asp Arg Ala His  Phe Met His His Tyr  Glu Asn Phe
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gaggaagatt tcttctccat tcatatccga gcagcagggg actggacaga aaatctcata    240

agggctttcg aacaacaata ttcaccaatt cccaggattg aagtggatgg tcccttggc    300

acagccagtg aggatgtttt ccagtatgaa gtggctgtgc tggttggagc aggaattggg    360

gtcaccccct ttgcttctat cttgaaatcc atctggtaca aattccagtg tgcagaccac    420

aacctcaaaa caaaaaagat ctatttctac tggatctgca gggagacagg tgccttttcc    480

tggttcaaca acctgttgac ttccctggaa caggagatgg aggaattagg caaagtgggt    540

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agaccaatgt gggacaatga gttttctaca atagctacct cccaccccaa gtctgtagtg    720

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